IEEE
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This issue includes details about the IEEE Computer Society's COMPCON'86, its only annual broad-scope professional conference

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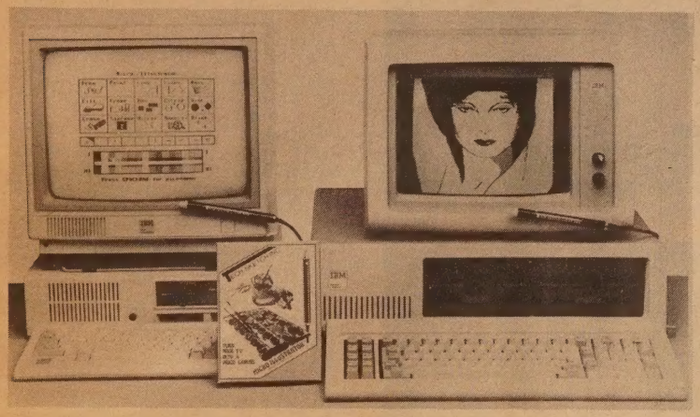
SILICON GULCH GAZETTE

January, 1986 | IEEE Computer Society Compcon'86 | Issue No. 43

Light Pen Graphics for Under $70



Tech Sketch has introduced a light pen color graphics system for the IBM PC and the PCjr with a suggested retail price of $69.95. That price includes the Micro Illustrator software and a lifetime warranty.

The Tech Sketch light pen has fingertip control and a coil-free cord for unrestricted movement.

The Micro Illustrator color software provides graphic features such as the ability to store light pen pictures on diskette and print pictures in color or black and white. The artist can select from ten different brush strokes and ten different drawing modes, including lines, rays, boxes, circles, color filling, free-hand drawing and more. Sixteen colors and sixteen shades are available. The program will erase mistakes, magnify to provide pixel-by-pixel resolution, store up to 48 screens on diskette, and allow binary storage of data for hard copy printing or telephone transmission.

The light pen plugs directly into either computer. A color graphics board is required on the IBM PC when using Micro Illustrator. No extra equipment is needed for the PCjr.

For further information, please contact: Tech Sketch, Inc., 26 Just Road, Fairfield NJ 07006.

Unique Opportunity to Keep Updated at Compcon'86, March 3-6, San Francisco

For the 21st time, 700-1,000 of computing's top professionals will gather at the IEEE Computer Society's Compcon International Computer Conference. Compcon'86 is the Society's only technical conference covering a broad spectrum of recent developments in computing. It will take place in Cathedral Hill Hotel — the old Jack Tar.

It offers computer professionals a unique opportunity to keep up with the state of their art — to remain current beyond their own present projects.

Tutorials: On Monday, March 3rd, there will be four full-day tutorials — on silicon compilers, medical graphics, expert systems, and high performance architectures.

Technical Sessions: During Tuesday through Thursday, March 4-6, over 100 speakers will give technical presentations in 39 sessions. Session topics will include: SDI technical feasibility; applied AI; 5th generation architectures and software; supercomputing; database machines; new personal computing; Unix; ISDN; MIPS; USA vs. Japan; computerized typesetting and publishing; digital radio; copyrights and patents; networking; applications; and much more.

Demonstrations: There will be hand-on demonstrations of half a dozen low-cost computer-aided engineering systems.

Mind melds: Opportunities to meet and confer with the wide range of professionals attending this premier conference is one of its major values. To aid such exchanges, Compcon'86 will host late afternoon buffets with wine-tasting on Tuesday and Wednesday.

Compcon'86 is open to Computer Society members and non-members, students and practicing professionals. Attendees may register for either or both of the conference program and a tutorial. A *Conference Digest* will be published, containing abstracts of many of the presentations, and is included in the registration fee.

See page 3 for registration details, and pages 7-9 for full program details.

Of Micro Giants & Computer Comedians

by Jim Warren

Before offering *useful* commentary, a word of warning — uh, explanation — about the *Gazette*, for those unwary folks who have not previously been subjected to it:

I created this rag nine years ago to sing praises of the 1st West Coast Computer Faire and pass along techno-gossip I found interesting. After drawing 47,000 folks to the 8th Faire in 1983, I gleefully sold the Computer Faire money machine to Prentice-Hall.

But — recognizing that the power of the press belongs to those who own one — I kept this time-suckin' tabloid. After all, sez I, no sense in keeping a venture that was merely highly profitable, when I could keep a ribald rag that barely broke even, but was enjoyable and provacative. (Now, you can better evaluate the quality of my judgement.)

The SGG is produced on a round-tuit basis, whenever an underwriter and I both agree to crank one out.

This column has afflicted these issues for some years — oblique observations, techno ticklers, turgid typewriter tantrums, and possibly insightful information.

Asilomar Secrets

For the past decade, 70-100 of micro-computing's top inventors and innovators have gathered for three days of candid discussions about microprocessors, microcomputing and micro futures.

This occurs in the IEEE's phone-free Asilomar Invitational Microcomputer Workshop, an hour's drive south of San Jose. Everybody talks; everybody listens — great sharing; great stuff! (For more details, drop me a note; next Workshop's in April.)

Though all presentations are off the record, I'm including some of the more entertaining asides as inter-section filler.

Asilomar aside:
"Now where'd I put my computer? I know I had it before dinner."

Computing's "Fair Witness"

Any o' you ex-hippies 'member "fair witnesses," from Robt. Heinlein's landmark '60's science fiction book, *Stranger in a Strange Land*? They were sorta souped-up public notaries combined with "friends of the court" — studiously neutral, absolutely accurate, totally honest and completely trustworthy. (I *said* it was fiction.) Well, computing has one of reality's closest approximations to a fair witness — Dr. Robert M. McClure.

And, like Heinlein's fair

continued on page 4

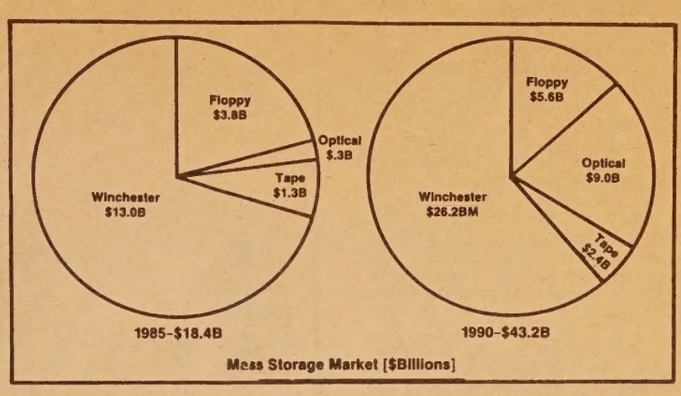
Don't Miss IEEE Computer Society's only broad-scope conference!

COMPCON '86

March 3-6, 1986
Cathedral Hill Hotel
San Francisco
Conferences details and registration information, inside.

Your Unique Opportunity to Keep Up with Computing Developments

OPTICAL MEMORY VS. MAGNETIC STORAGE



In 1990, the market for optical data storage will reach $9.0 billion, growing from a mere $200 million in 1985.

The development of this volatile new technology is the subject of a new technology impact report by Electronic Trend Publications entitled, "Optical Memory's Impact on Magnetic Storage and Computer Systems Architecture." The report examines trends in CD ROM, write-once, read-many optical disk players and systems, and the various types of erasable optical disk products.

The study, authored by Jonah McLeod, details the problems each optical technology still faces to become established. It examines the standards issues that have impeded the technology's growth. It looks at applications that are now beginning to find optical attractive alternatives to paper-based and magnetic storage-based systems already in place. McLeod forecasts that "by the end of this century, Optical Memory technology will have displaced all forms of magnetic storage as the dominent technology".

The study also examines the key manufacturers who are shaping the market development — Philips and Alcatel — Thomson — Gigadisc in Europe and every major Japanese computer manufacturer in Japan. The U.S. is far behind the rest of the world in optical disk technology with only 3M Company and Verbatim making recent announcements in media and drives. "The U.S.," said McLeod, "has few large computer manufacturers aggressively pursuing optical technology — Storage Technology Corporation, Optimem, Optical Storage International, and new start-ups like Optotech, Information Storage, Inc., and Cherokee Data Systems".

"Optical Memory's Impact on Magnetic Storage" is priced at $1,250.

Electronic Trend Publications, 10080 N Wolfe Road #372, Cupertino CA 95014, (408)996-7416.

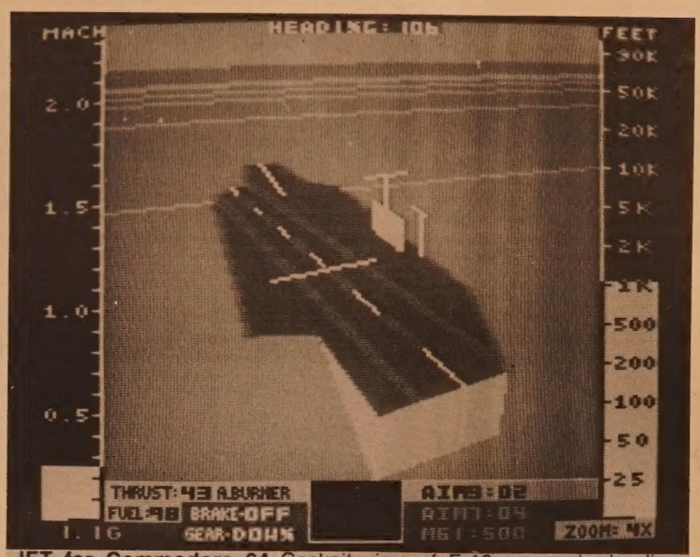
FLIGHT SIMULATOR

Jet, a high-performance jet flight simulator for the Commodore 64 and Commodore 128 computers, has recently been introduced by the author of Flight Simulator II.

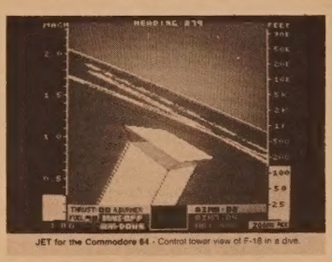
Jet simulates two fast and maneuverable supersonic jet fighters, a land-based F-16 Fighting Falcon or carrier-based F-18 Hornet. The program includes a free-flight con-combat mode, and offers a variety of land/sea strike or dogfight options to test the pilot's skills under different combat conditions.

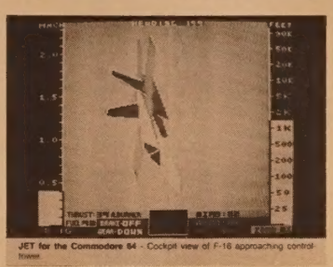
The aircraft is equipped with a "Heads Up Display" for monitoring instruments and environment simultaneously. The display provides a full-screen out-the-window view. Aircraft control plus ballistic performance provides aerobatic maneuverability modeled after a modern jet fighter. Either aircraft can be fitted with a variety of weapon types (air-to-air missiles, AGM missiles, or smart bombs) depending on the mission selected.

Jet is compatible with SubLOGIC Scenery Disks. These optional Scenery Disks allow the user to fly anywhere in the continental United States. Jet can also load scenery directly off the Flight Simulator II disk. Jet requires a Commodore 64 or Commodore 128 computer with one disk drive. The program incorporates SubLOGIC's high-speed graphic drivers, and introduces scenery display concepts for improved viewing on either color or monochrome monitors.



JET for Commodore 64-Cockpit view of F-18 on carrier-landing


JET for the Commodore 64 - Control tower view of F-18 in a dive.


JET for the Commodore 64 - Cockpit view of F-18 approaching control tower

Jet is available on disk for $39.95.

SubLOGIC Corp., 713 Edgebrook Dr., Champaign IL 61820.

AutoLISP and AutoSHADE for AutoCAD

AutoLISP is an implementation of the LISP programming language embedded within AutoCAD. (AutoCAD is a multipurpose two-dimensional and threedimensional visualization package for engineers, designers, and drafters. AutoCAD runs on approximately 31 different microcomputers, and over 120 peripheral devices.) An extension of the Variables and Expressions feature of AutoCAD, AutoLISP allows users and developers to write macro programs and functions in a high-level language well-suited to graphics applications. AutoLISP can be used to program complete applications in such areas as civil engineering, architecture, piping, and electrical and electronic engineering. AutoLISP provides the applications programmer with AutoCAD's graphics-editing power, which implements applications programs for such disciplines as machine tooling or mapping — the only limit is the developer's imagination."

AutoSHADE is a 3-D rendering system capable of producing full-color facet-shaded, smooth-shaded, and global-shaded images. AutoSHADE will be sold as an add-on postprocessor to AutoCAD. Requirements include a medium to high resolution display with at least 256 simultaneous colors. The system needs a minimum of 640K and a math coprocessor.

Autodesk, Inc., 2320 Marinship Way, Sausalito CA 94965, (415)332-2344.

Unusual Applications of Electronic Spreadsheet Concepts

Alan Kay of Apple Computer will discuss non-traditional uses of electronic spreadsheets at Compcon '86, March 3-6 in San Francisco.

It is becoming evident that the electronic spreadsheet constitutes a new programming model related to earlier, object-oriented programming languages, and its power and applicability extends to areas far beyond its traditional domains.

This session on "Non-Traditional Applications of the Electronic Spreadsheet Programs" will address the fundamental characteristics of the spreadsheet programming environment, discuss new spreadsheet applications in areas such as simulation of electrical power systems and explore future extensions of spreadsheet software technology, such as the use of the spreadsheet as an efficient programming model for parallel processors.

The invention of the electronic spreadsheet was one of the key innovations spurring the proliferation of personal computers. Currently programs such as Lotus 1-2-3, Supercalc, etc., are best sellers and form the main computing environment for millions of computer users. The electronic spreadsheet gives non-technical users the ability to create customized solutions to their specific problems, primarily in accounting, budgeting, and finance, without engaging in what is traditionally known as "computer programming."

Session chair Blake Hannaford of U.C. Berkeley will present "The Electronic Spreadsheet: A Workstation Front-end to Parallel Processors." Alan Kay's talk is entitled "Spreading the Spreadsheet."

Free SGG Subscription

The *Silicon Gulch Gazette* is available without cost — worth at least every penny you pay for it. It focuses on microcomputing topics. It is published on a round-tuit basis, whenever the mood and underwriting strikes the editor/publisher.

For a free subscription, send name and address to:

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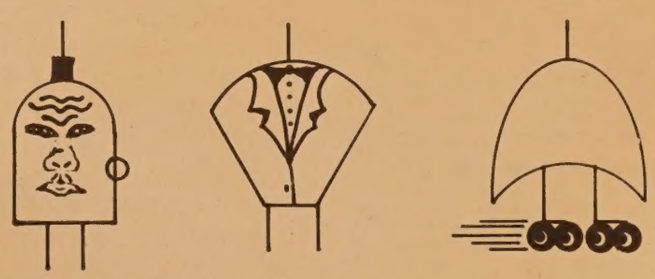
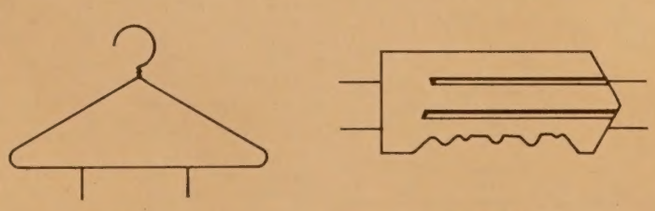
345 Swett Road
Woodside, CA 94062

Please do not phone; a written request is required.

[IL]LOGIC SYMBOLS

In the early '70's, the bulletin boards of Stanford's Digital Systems Lab were covered with a wide range of "new logic" symbols, illustrating the rigorous research interests of the students at that top-rated institution. I am unable to locate my notes on those important scientific proposals, however the following gives the flavor of some of the suggested syntax. —*JW*


T gate MAFIA gate HI-SPEED gate


HUNG gate LATCH gate

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Submit you own [I]Logic Symbols for publication in future Gazette's, or wherever else we have the inclination. We promise to give full attribution for first submissions — or, we promise never to divulge the source, if you prefer.

Synd your Syntax to: [IL]Logic Symbols, 345 Swett Rd., Woodside CA 94062. Include name and address for attribution — the usual compensation offered for submitting innovative proposals to sophisticated technical journals such as this.

"[IL]Logic Symbols" is a trade-mark of the Silicon Gulch Gazette, and all submissions become the property of the Gazette.

What do Copyrights and Patents Protect?

Compcon'86 will include discussion of issues surrounding copyright protection and infringement.

Issues include the scope and limitations of the Copyright Law, comparable and compatable programs, protection of program design and organization, and how to distinguish between reverse engineering and semiconductor chip piracy.

In "The Copying of Comparable Programs under the Copyright Law," Ken Leibman will explain what exactly is meant by "copying." This distinction is equally important for a program developer who sees a program in the market which he suspects is a copy of his program, and for the entrepreneuer wishing to develop a program comparable to an already successful one.

The law clearly states that marketing of an identical copy is an infringement. The more interesting questions concern comparable and compatible programs. Comparable programs are those which perform similar or identical functions, such as conversions from one language to another. Compatible programs are comparable programs which interface to the same other software.

In "The Scope of Software Copyright: Is 'Program Design' Protectable?" Salem Katsh will discuss the appropriate scope of legal protection for software, focusing on whether the design of the program is entitled to protection under the Copyright Act.

Recent lower court decisions have concluded that copyright can be used to protect the design of a program. However, complexities of copyright laws and the nature of computer programs suggest that these cases may not provide the final answer.

Richard H. Stern will explain the new Semiconductor Chip Protection Act (SCPA), in "Distinguishing Legitimate Reverse Engineering from Unlawful Chip Piracy Under the Semiconductor Chip Protection Act." Reverse engineering is a privilege guaranteed by the SCPA, while piracy is prohibited. Important concepts in distinguishing the two include the functional importance of chip layout features and arbitrary design choices. Analysis focuses on the overall floor plan of the chip and the layout of elements within blocks of the chip.

"The Expansive Limits of Copyright Protection for Computer Coded or Micro Coded Programs" will be presented by Jack Brown. The session will be chaired by Alan Smith of U.C. Berkeley.

Compcon'86 — a unique chance to keep current in computing.

MARCH 3–6 **Spring COMPCON 86**

THIRTY-FIRST IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE
CATHEDRAL HILL HOTEL, SAN FRANCISCO, CALIFORNIA

Providing Technical Perspective
Tutorials: Monday, March 3
Conference: Tues-Thur, March 4-6

YOU can't afford to miss COMPCON Spring '86!

The year's only broad-based computing conference by the world's largest computer society.

KEY HOT TOPICS:

• SUPERCOMPUTERS • SDI SOFTWARE RELIABILITY • AI APPLICATIONS • JAPANESE SOFTWARE PRACTICES • RISC VS. CISC

PROGRAM HIGHLIGHTS

(Subject to adjustment)

PLENARY TALKS:
3/4/86 AM

"Current Events in the Application of AI Technologies."
Dr. Thomas P. Kehler, Vice President, Intellicorp.
This exploding technology will be discussed using "real-world" examples describing successes, challenges and impact.

3/6/86 PM

"Japanese and Software—A Good Match?"
Les Belady, Vice President, MCC.
Discussion of experiences while directing a software project in Tokyo including planning, implementation, work ethic and how the U.S. can stay ahead.

SUPERCOMPUTERS:
(Range Maxi's to Mini's). 3/4/86 AM, 3/6/86 AM & PM.

Comparative Review: CRAYs, CYBER 205, ETA Systems, FUJITSU VP Series, NEC SX Series, HITACHI S810 Series, "Trend Projection."

Mainframe Vector Systems: IBM SIERRA 3090, CYBER 180/990, and Japanese entries, Other U.S. Efforts in Supercomputers.

Super-Mini's: Trends, Alternatives, Affordable Systems.

STRATEGIC DEFENSE INITIATIVE:
"Reliability of SDI Software." 3/4/86 PM.

Discussion: Participants include two senior members of the Dept. of Defense SDI Panel and two of the best-known critics of SDI software reliability.

NETWORKS:
(Unified voice & data). 3/4/86 PM, 3/5/86 AM, 3/6/86 AM.

ISDN: Standards, Packets, IC Solutions, Field Trials, Corporate Networking, Terminals, Workstations, Hosts.

PC Net Operating Systems: Distributed, High-performance, Services.

Radio Communications Applied to Nets.

Manufacturing Automation Protocol.

MICROCOMPUTER APPLICATIONS:
3/4/86 PM, 3/5/86 AM & PM.

Typesetting; Optical Publishing; Non-traditional Spreadsheets; Low Cost Computing Applied to Communications Technology; Light Industrial Robotics.

SYSTEM ARCHITECTURES:
3/4/86 AM & PM, 3/5/86 AM & PM.

RISC vs. CISC; RISC Compiler; RISC Addressing for UNIX; Next Generation of Powerful Home Computers; MIPS Micro.; CLIPPER Micro.; CMOS CPU; UNIX Portability; SPECTRUM Family of Computers.

DATA BASE SYSTEMS:
3/5/86 PM, 3/6/86 AM.

CAD/CAM DBMS: Knowledge Base Management, Integrated Manufacturing.

Object Oriented DBMS: Design Evolution and Consistency, Persistent Objects in LISP, DBMS Management, Procedures Extending Rel. DBMS.

Concurrency Control: Distributed for Rel. DBMS, For Queries in Rings, In Distributed Systems with File and Process Migration.

Data Base Machines: Considerations for 1990 Systems, A Design Revisited, DBMS in Local Area Networks.

FIFTH GENERATION ARCHITECTURES AND LANGUAGES:
3/5/86 AM

New Parallel Interface Method; PSI Micro-Interpreter; AQUARIUS; PROLOG Compiler Optimization; PROLOG Object Language; Garbage Collector.

VLSI:
3/6/86 AM & PM

Designing with GaAs Components; Silicon Compilers—A User's Experience; *Testing:* "Real," Bult-in Testing; Simulation Strategies and Fault Models; Automatic Test Generation.

OTHER TOPICS OF INTEREST:
3/4/86 AM, 3/6/86 PM
Copyright and Patent Protection; Accrediting Computer Science Curriculum?

Compcon is a technical conference organized by and for computer professionals through the IEEE Computer Society, the largest organization of computer professionals in the world.

Full Spectrum: Although the Computer Society sponsors numerous special-interest conferences each year, this is the *only* IEEE CS conference that provides a broad-scope survey of current developments and state-of-the-art results.

Keep Up to Date: It is one of the few opportunities for computer professionals to update themselves on recent developments in computing.

Meet Computing's Leaders: Compcon is large enough to offer a robust conference program, and small enough to allow the 1,000-or-so attendees to meet and confer with others on similar interests.

Social Hours for Info Exchange: To further facilitate opportunities for invaluable one-on-one discussions, Compcon hosts social hours on Tuesday and Wednesday afternoons, following the 3:30pm-5pm conference sessions.

REGISTER BY FEBRUARY 14th—AND SAVE MONEY!

CONFERENCE, Tuesday-Thursday, March 4-6, 8:30 AM to 5 PM
Members: ☐ $150 (before 2/14/86) ☐ $180 (after 2/14/86)
Non-Members: ☐ $200 (before 2/14/86) ☐ $230 (after 2/14/86)

TUTORIALS, Monday, March 3, 9 AM to 5 PM
Members: ☐ $150 (before 2/14/86) ☐ $180 (after 2/14/86)
Non-Members: ☐ $200 (before 2/14/86) ☐ $230 (after 2/14/86)

CHECK ONE ONLY
1. ☐ Silicon Compilation
2. ☐ Complex Computer Graphics: Illustrated by Drug Design and Genetic Engineering.
3. ☐ Issues in Expert Systems: Overview
4. ☐ High Performance Computing Architecture

CATHEDRAL HILL HOTEL, San Francisco
For Room Reservations
Call (415) 776-8200 and mention
COMPCON '86 for Special Rate.

Requests for refunds must be received in writing no later than February 21, 1986. Limited tutorial attendance is on a first-paid, first-served basis. Conference registration fee includes one copy of the *Compcon Digest of Papers*, as well as admittance to the conference-hosted party.
*PAYMENT MUST BE POSTMARKED BY FEBRUARY 14 TO QUALIFY FOR ADVANCE REGISTRATION RATES. **Note:** AFTER 2/14/86 ALL RATES INCREASE BY $30.

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ON-SITE REGISTRATION will be accepted at the Cathedral Hill Hotel beginning Sunday evening, March 2, 1986.
Payment should be for sum of boxes checked. No purchase orders. Foreign checks must be in U.S. dollars drawn on U.S. bank. Credit card registration is available by phone.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

The Latest In Affordable Super-Minis/Mini-Supers

A new breed of computer, the mini-supercomputer, is now available for the scientific computing market. These machines provide very cost-effective means of carrying out calculations required in various scientific and engineering applications. "Crayettes," "near-supercomputers," and "affordable supercomputers" are some of the labels given to these high-performance machines.

Whether employing vector processing or multiprocessing, all are capable of a high performance/price ratio. Steve Wallach of Convex will discuss "The Convex 64-bit Supercomputer System." The Elxsi-System 6400 will be examined by Steve McGrogan of Elxsi in "Parallelizing Large Existing Programs — Methodology and Experiences." Woody Lichenstein of Culler Scientific will discuss "The Architecture of the Culler 7." Dr. Jack Dongarra of Argonne National Laboratory will chair the session, "The New Wave of Affordable Super-Minis/Mini-Supers," at Compcon '86 March 3-6.

The ITT XTRA XP computer is reportedly 30% faster than the IBM PC/AT. It has PC/XT compatibility, uses an Intel 80286, is available with 512K of 0-wait-state RAM, expandable to 1.64KB. For more information, contact ITT Information Systems, (408)945-8950.

Compcon'86 session

IMPACT OF MICROCOMPUTING ON NAVIGATION

Finding yourself — on the planet or in your car — will be explored in a fascinating Compcon'86 session chaired by Dr. Fred Clegg of H-P.

"A Novel Approach to Automotive Navigation and Map Display," by Stan Honey and W. B. Zavoli of Etak Corp., will describe the economical Etak Navigator, its function, hardware and software.

The Etak Navigator is an electronic map for use in vehicles. It continuously displays the vehicle's position and direction on a changing map of the surrounding area. When the driver selects a destination, the map is scaled to show both the car and destination. The direction and distance to the destination are continuously indicated. As the car is driven, the map changes accordingly. A self-contained navigation technique is used, utilizing a compass and wheel sensors, a digital map database, and an adaptive self-calibrating navigation algorithm.

Advances in microprocessor technology have encouraged dramatic advances in Global Positioning System (GPS) navigation receiver technology. Cheryl Ould of Tau Corp. will discuss these changes in "Microprocessor Impact of Architecture and Performance on GPS User Equipment."

Microprocessor evolution has been a pacing factor in partitioning receiver processing and the degree of complexity of algorithms. Ould will examine the evolution of expanded digital signal processing and the microprocessor system architectural consequences of enhanced processing power in GPS receivers. These advances have resulted in much-improved receiver performance at stable or declining system costs.

IEEE Computer Society's COMPCON '86

It Offers You a Unique Opportunity to Keep Up with Your Profession

March 3-6 **San Francisco**

Online Databases

The Directory of Online Databases, containing information on online databases and online information services, is published quarterly and provides coverage of the thousands of databases that are available to users through hundreds of online, interactive systems.

In July 1985, in a joint announcement, Cuadra Associates and Elsevier Science Publishing Co., Inc. revealed the intention to establish a joint venture to publish and market the Directory and to develop new products emanating from the Directory's own database. The purpose of the joint venture is to exploit the growing need for useful information about the availability of online databases and to meet that need through a variety of information products and services based on the research done for the directory.

Just as the Cuadra and Elsevier representatives were inking the final documents establishing Cuadra/Elsevier, they received notice that one more online service, DataArkiv, plans to offer the Directory online. DataArkiv, which is based in Stockholm, provides online services to the Scandinavian, European, and other countries throughout the world.

The other online services that have already acquired the Directory and have announced their online versions are Data-Star, Telesystemes-Questel, and Westlaw, the computer-assisted legal research service of West Publishing Company.

A one-year subscription includes two complete editions and two update supplements for $95.

Cuadra Associates, 2001 Wilshire Blvd #305, Santa Monica CA 90403, (213)829-9972; or Elsevier Science Publishing Co., Inc., 52 Vanderbilt Ave, New York NY 10017, (212)370-5520 ext.1537.

GIANTS, COMEDIANS ...

continued from page 1

witnesses — and very much *unlike* so many of our industry's pontificating prima donnas — Bob does not "beat his own drum." So, I'm gonna bang it a bit, for him.

We must support excellence, lest we be left with only mediocracy.

McClure is one of the very few people I know who — when he says "x" — I can trust that "x" is true, completely true, and nothing but the truth. Not only is he trustworthy, he is also a premier technical professional. I never need to check his statements of fact, nor discount his technical judgements.

And, folks, in this hype-filled industry and era, that's invaluable!

Program [Un]Portability

I've known Bob for about fifteen years, ever since consulting with him in the early '70's regarding doctoral research on automatic program portability. (I never completed it. I wanted to produce a dissertation that had practical value — foolish me.)

McClure is one of the industry's more experienced program truckers. He's moved 100,000-line Fortran programs between heterogeneous mainframes and on down to minis; ported Knuth's complex TEX from a PDP-10 written in SAIL to a PDP-11 written in C; and regularly expands the Theory of [In]Compatability by porting systems software under Unix.

A "Technological Attorney"

Although Bob has taught at institutions such as SMU and Stanford, he is primarily an independent software and hardware designer, and a long-time international consultant — meaning someone to whom major corporations turn for technical advice and judgement.

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Compcon'86 session

USA vs. Japan: Who Will Win and Why?

Identification of the key factors affecting Japan/USA computer industry competition will be the major focus of "USA versus Japan: Who Will Win and Why?" at Compcon '86 in San Francisco. Two alternative views on the optimum course of action for American companies will be provided by Julian Gresser and George E. Lindamood, both experienced with Japanese and American industries.

Mr. Gresser, an attorney with Nutter, McClennen & Fish, will present "Your Own Japan Operation for $100,000 — Nothing Down." He is the author of *Partners in Prosperity: Strategic Industries For the U.S. and Japan,* and of numerous papers about Japanese and American industrial affairs.

"The Samurai and the Cowboy: Bushido vs. Macho," by Mr. Lindamood of Hood College will be the second presentation. He has been a longtime resident of Japan (where he was with Burroughs Corp and the US Office of Naval Research), and has extensive experience in the American and Japanese computer industries.

The session will be chaired by Dr. Edward Miller of Software Research Association.

Silicon Gulch Gazette
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microcomputing's first news[?]paper, established in 1977

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This ribald rag is published on a round-tuit basis — whenever the editor chooses to produce it and someone chooses to underwrite it.
The current issue was produced to provide promotion and information about the IEEE's Compcon Conference, in a more-palatable form than the usual promo-only brochures. It was produced and distributed — essentially at cost — by Jim Warren, a long-time member of the Compcon Program Committee.
Previous issues were underwritten by Computer Faire through 1983, and by Autodesk and Applied i in 1984 — who recognized that, although there are no free lunches, it is worthwhile to offer an inexpensive, tasty sandwich-for-the-mind.
Editorial content of all issues is entirely under control of the editor, and opinions of the editor are entirely his own. Issue underwriters did not purchase those opinions — and should not be blamed for them.
For a free "subscription" — worth at least what you pay for it — send name and U.S. mailing address to "SGG Subscription", 345 Swett Rd., Woodside CA 94062 — and you'll probably never escape the mailing list thereafter.

GIANTS, COMEDIANS ...
continued from page 4

To differentiate from freelance code hackers, who also call themselves consultants, he sometimes says he is a "technological attorney" — someone who keeps clients from getting into technical trouble. He has consulted for such obscure companies as IBM, GE, NCR, TI, GM, Burroughs, AEG/Telefunken, Siemens, Hitachi, Victor (b. p. — before Peddle), etc.

Optimizing Translators Offered with Source Code

When he's not globe-hopping, McClure hangs out at his company near Denver (Unidot, 303-526-9263). Unidot offerings include compilers, cross compilers and cross assemblers. And — for joy to a hacker's heart — the only way he peddles 'em is in *source-code form!*

His offerings include native and cross compilers for C and Fortran (serving the more elderly of us), plus cross assemblers for numerous micros — 80xx, 80286, 68000, Z8, Z80, National 320xx, Fairchild 9450, AMD 2900, TI 32010, Signetics 8X line, ... to name a few. They generate code for RAM, PROM's and PAL's. As is illustrated by the 2900 assembler, he also supports microprogramming.

And he has done some exciting work in computerized typesetting — and shares my horror at the underpowered, overpriced, obscene mish-mash that traditional typesetting manufacturers foist off on their captive, ill-informed customers.

Asilomar again: *"Time flies when you don't know what you're doing."*

PostScript Postscript

Speaking of typsetting: First, there's all the rest of the world's typesetting systems. Then, there's Adobe's Systems PostScript — perhaps best known 'cause it's in Apple's Canonized LaserWriter.

PostScript is essentially a graphics language interpreter especially tuned for handling typefonts. McClure calls it, "Forth with pictures".

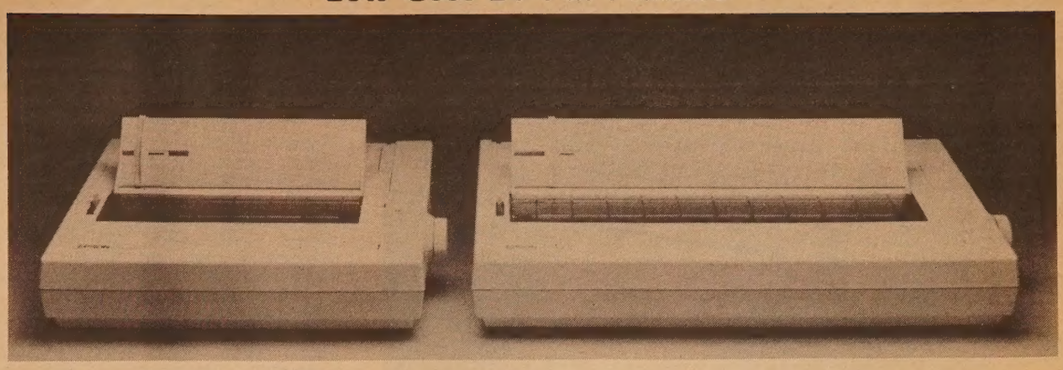
The brainchild of John Warnock and Chuck Geshke — ex-X-PARCites — it offers a significant conceptual breakthrough in typesetting control, particularly when coupled with digital font generation. (Notes: X-PARC is Xerox's exotic Palo Alto Research Center; Adobe's also in Palo Alto.)

Leap Forward; Step Back; Look Out!

However, like many major leaps forward in this industry, it well may be more valuable for *suggesting* better solutions, than as *the* solution to past typesetting traumas. Certainly it is

continued on page 6

Low Cost 24-Pin Printers



Two new dot-matrix printers—the LQ-800 and wide carriage LQ-1000, offer high resolution in a 24-pin dot-matrix printers. Through unique option modules, they support extended Epson control codes or emulate IBM or Diablo 630 printers. Both retail under $1000.

The printers use a printhead with 24 fine (0.2 mm) printwires divided into two vertical 12-pin columns. Overlapping dots are printed by two columns to form nearly solid lines, creating resolution of character comparable to that of a typewriter. This is done in a single pass of the printhead. High resolution printing normally requires multiple passes, which slows the printer down.

In addition to built-in Epson standard control codes, the LQ-800 and LQ-1000 feature option modules that provide compatibility with the vast libraries of application software packages written for the popular IBM or Diablo printers. A user simply plugs in the cartridge for the appropriate printer type and runs the software. The Epson Extended Code Module supports block graphics character sets patterned after IBM's graphics character set, provides access to font modules and enables additional default settings.

A single stroke of a front panel button lets users choose either highspeed draft copy output at 180 characters per second (CPS) or letter-quality (LQ) copy at 60 CPS. A resolution of up to 360 dots-per-inch (DPI) horizontally and 180 DPI vertically provides a wealth of graphics possibilities. Besides three built-in fonts (draft, LQ and proportional), optional font modules available include Courier, Script, Prestige Elite, Sanserif and OCR B.

The printers feature a compact design and are light weight. Epson's LQ-800 retails for a list price of $799 and the LQ-1000 lists at $995. Both models come standard with built-in serial and parallel interfaces and friction paper feed. A built-in 7K byte buffer increases productivity by allowing the user to continue using the computer while printing. Optional tractor and cut sheet feeders for the LQ-800 are available at prices of $499.95 and $129.95, respectively. The LQ-1000 has tractor and cut sheet feeders available at $59.95 and $169.95, respectively. The printers also feature logic-seeking bidirectional printing, 96 ASCII, 13 international character sets and proportional space printing.

Epson America's Computer Product Division, 2780 Lomita Blvd., Torrance CA 90505, (213)539-9140, outside CA (800)421-5426.

Compcon86 session

Light Industrial Robotics

Robotics can be used effectively in industry to perform tasks ranging from flexible assembly to handling hazardous materials. Current and potential applications of robotics will be detailed at Compcon'86.

The design and layout of a robotic workcell will be discussed by Aram Soghikian of Intelmatec in "An Example Industrial Robotic Application and Interfaces." Techniques for reducing cycle-time and their impact on workcell layout will be explained. Examples include hard disk handling, printer circuit board component insertion, and others.

Recent advances in computer technology, robotics and artificial intelligence have overcome past problems with capability and performance of flexible assembly equipment. The use of flexible assembly offers competitive advantage to manufacturers by enhancing product quality, productivity and manufacturing costs. Craig Jennings of Adept Technology will discuss various aspects of these techniques in "Flexible Assembly Works."

In "The Disposable Robot," Gordon Wallace of Robotic Systems International will examine potential use of small robotic manipulators for handling hazardous materials. Robots can handle dangerous disease cultures in medicine and toxic mixtures in chemistry, thus protecting humans from dangerous environments. Modern, low-cost manipulators make disposal an economically viable and convenient alternative to expensive decontamination.

Compcon'86 session

Measuring Software Quality

Development of a software quality metrics standard will be presented in the panel session, "Software Quality Metrics," at Compcon '86, March 3-6 in San Francisco. The panel will focus on the work of the IEEE Software Engineering Standards Working Group, reporting the status of their efforts to establish a standard and describing the form the standard will take. The session will be technical in nature and will not address the politics of standards development.

Topics covered include software quality as it relates to various phases of the life cycle; establishment of quality goals by management; communication of the goals as criteria for technical personnel; translation of criteria into measurable elements of the software — the metrics; procedures for implementation of the metrics, and examples of quality factors and criteria.

The session will be chaired by Norm Schneidewind of the Naval Postgraduate School. He also chairs the IEEE Software Engineering Standards Working Group. Other panelists are Raghu Signh of the Space and Naval Warfare System Command, and Al Freund of Allen-Bradley.

Compcon'86 session

U.S. Efforts Towards Supercomputers

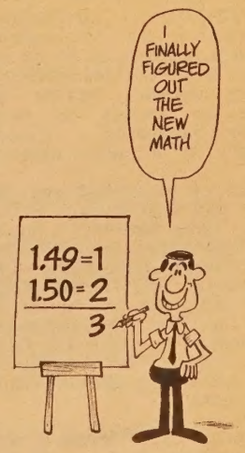
Three speakers representing major government programs utilizing parallel processing systems will describe aspects of their program activities in "U.S. Efforts Towards Supercomputers," at Compcon '86 in San Francisco. Speakers from the Department of Energy (DOE), the Institute for Defense Analysis and the Defense Advanced Research Projects Agency (DARPA) will discuss research directions being pursued and recent results. Each will give a perspective on his program's relationship to other programs.

Session chair Paul Schneck will discuss the Supercomputing Research Center (SRC), a new division of the Institute for Defense Analyses. The SRC will perform basic research in parallel processing and its applications to national security problems.

Dr. James Decker of the DOE will present "Activities of the Federal Coordinating Committee for Science." The DOE is looking at numerical supercomputers for use by its Livermore and Los Alamos National Laboratories.

"The DARPA Strategic Computing Initiative," will be discussed by Dr. Craig Fields. DARPA is seeking to create machines to support artificial intelligence applications.

Rounding-off



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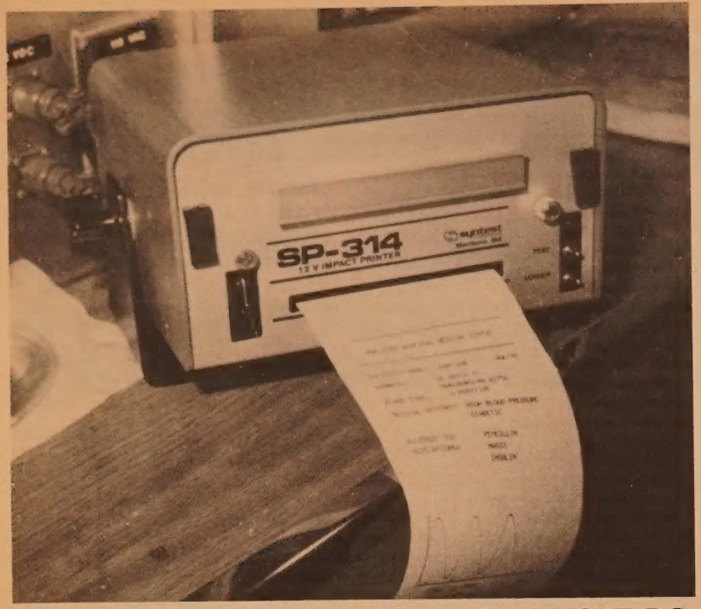

DOT MATRIX PRINTER RUNS ON 12 VOLT DC

Syntest Corporation recently announced the SP-314 dot matrix alphanumeric printer featuring 12 volt D.C. operation, allowing complete independence from power lines. Other features of the SP-314 are buffered 40 column impact printing, RS-232 serial and parallel inputs, crystal controlled baud rate, 96 character ASCII set plus double width, and a self test routine. This unit includes graphic capabilities for special printer applications. Rugged design as well as easy paper loading make the SP-314 an ideal choice for mobile marine applications where independence from conventional power is desired.

Specifications
*40 column dot matrix impact printing on 4.25" paper
*12 VDC +/- 10% @ 3.5 amps. 600mA standby current (non-printing) *Crystal controlled baud rate jumper selectable for 110, 150, 300, 600, 1200, 2400, 4800 and 9600 baud.
*Serial ASCII input—RS-232C or TTL compatible, (positive true logic.)
*Physical dimensions—8.5" wide x 5.75" high x 8.5" deep, weight 5.5 lbs.

Single unit price is $605.00. For additional information, contact: Systest, 40 Locke Dr, Marlboro MS 01752

Board-Level SNA Emulation Package

The mSNA/3270, an IBM Systems Network Architecture (SNA) emulation software package, gives Multibus systems integrators a way to offer product applications which can communicate with IBM mainframe computers over an SNA network.

The mSNA/3270 software allows the Multibus Host to connect to an IBM mainframe by emulating a remote 3274 cluster controller. Terminals and printers connected to the local Host can exchange data with the IBM mainframe as if they were 3278 terminals and 3287 printers. The package also provides an Application Program Interface, enabling developers to build applications that integrate data from both the IBM mainframe and the Multibus Host. The package is provided as a self-contained, executable load module which is downloaded into a communications processor board with the provided utilities.

The mSNA/3270 package runs on Multibus communications processor boards. It is shipped in a standard configuration using standard iRMX, Unix or Xenix. The product can be fully evaluated in days. The mSNA/3270 package is priced on a per-copy basis from $5000 to $200, based on quantity. The product will be available in the first quarter of 1986.

Marianne Cohn, Systems Strategies Inc., 225 West 34th St., New York NY 10001, (212) 279-8400.

— FOR SALE — Broadcast-Quality, Professional Video Gear

This equipment was purchased — brand new — around January, 1983. It has only been used to produce two video tutorials, each less than a hour in length, and for half a dozen or so 1-5 day shoots. Everything guaranteed properly operational. Prices in parentheses are new cost; following price are sale prices. There are NO SALES TAXES on this used equipment.

CAMERA, MONITOR & ACCESSORIES
Ikegami HL-79DAL Camera ($31,570) $25,250
Fujinon 14x9.5 Lens w/2X Extender ($4,617) $3,700
Fujinon Wide-Angle Adaptor ($977) $800
ITC Viewfinder ($1,873) $1,500
O'Conner-50 Fluid Head ($1,732) $1,400
Hihat Camera Mount ($145) $100
O'Conner Panhandle ($65) $50
Lisand Sticks w/ Spreader ($499) 400
Tripod Tube ($102) $50
ITC AC Power Adaptor ($468) $350
Nicad Snap-On Batteries (2) ($702) $550
Battery Fast Charger ($280) $200
Videotek color monitor w/spkr ($1,082) $900
Hitachi vo99 waveform monitor ($1,011) $800
Lee-Ray Crash Cart ($462) $350
Porta Pattern Chart ($225) $200
studio conversion kit: includes rear servo control, focus handle, flex cable, mounting clamp. ($714) $550
subtotal: ($46,524) $37,150
TOTAL PACKAGE: $35,300

VIDEO & AUDIO RECORDERS & MICS
Sony BVU-110 3/4" Video Recorder ($5,490) $4,400
Sony AC Power Supply ($474) $350
BK-112 Time-Code Card ($1,295) $1,000
ESE timecode rdr/generator ($989) 800
Cine-60 Dual Nicad Charger ($140) $100
Otari 5050B Reel/Reel Audio Deck ($2,200) $1,750
Sony Wireless Microphone System ($2,965) $2,400
Tram Lavaler Microphones (2) ($341) 300
subtotal: ($16,674) $13,300
TOTAL PACKAGE: $12,600

VIDEO & PHOTO LIGHTING
Lowell 4-Light Tota Kit ($1,024) $800
Lowell 4-Light Omni Kit ($1,130) $900
Light-standard water-weights (4) ($73) $50
Lowell Reflector ($62) $50
subtotal: ($2,289) $1,800
TOTAL PACKAGE: $1,700

EXTRA STUFF
Power Sonic 20-amp Gel Cel ($66) $50
Power Sonic 4-amp Charger ($60) $50
subtotal: ($126) $100
TOTAL PACKAGE: free w/others

Terms: 100% down, $0 to pay.
Prices are subject to change at the whim of the whimsical owner. To discuss purchases, contact: Jim Warren, (415)851-7078.

GIANTS, COMEDIANS ...
continued from page 5

a conceptual improvement over the abominations offered by traditional typesetting makers. However, interpretation from verbose "source code" to massive "graphics object code" has severe limitations.

Watch for further improvements — now that innovative computer folks are finally grabbing typsetting out of the arthritic hands of the old-line manufacturers. Incidentally, my guess is that the computer industry is likely to do an end-run around the traditional typesetting industry, before they wake up enough to realize what's happening. Couldn't happen to a more deserving mob.

(Toot of own horn: McClure and I have been working on a "new, improved" typesetting system. My name for it is "SuperScript" [copyright 1985, trademark 1985, servicemark 1985; prototype sold under that name in 1985 — i.e, the name's claimed]. It's too early to release details, but watch for more about SuperScript[tm] in future issues.)

Asilomar Priest: *"Forth is better than anything else."*
Retort: *"If something ails you, rub Forth oil on it."*

Of Princes & Villians

Seems like its time to review the mental whiplash foisted on their readers by irresponsible newspapers/reporters/columnists — who stereotype various micro persona. From the position of knowing most of the

continued on page 11

Compcon'86 demonstrations

Demos of Low-Cost Computer Aided Engineering

For the first time, the IEEE's Compcon conference will offer hands-on, detailed demonstrations of half a dozen low-cost CAE systems. These are not your usual trade exhibits — the demonstrators were refereed by a Compcon committee chaired by IBM's Ken Majithia (who has also long been active in Bay Area IEEE activities). Demonstration systems were selected for their low cost, willingness to give detailed technical demos, and for their probable interest to computer professionals. They are not paying for exhibit space — i.e., they were chosen as technical demonstrations, not simple sales pitches.

A *preliminary* list of demonstration systems includes VERILOG from Gateway Design Automation, LOGICIAN from Daisy Systems, CADAT from HHB Systems, a variety of systems from Information Systems Design, and VIEW LOGIC.

Compcon'86 attendees will have the opportunity for detailed examination and experimentation with the demonstration systems, working with knowledgable systems experts, in a far less chaotic environment than is found in the large trade exhibitions.

Others working with Ken Majithia on the Compcon Demos Committee included Steve Miller from SRI International (General Chair of NCC'78) and Glen Langdon from IBM (General Chair of Compcon'86).

Additionally, Compcon is working with the San Francisco Bay Section IEEE in offering a follow-up full-day Saturday seminar on CAE — for $70 or less.

The Next Generation Of Powerful Home Computers

Though doomsayers have kissed the home computer goodbye, it may be on the edge of a further revolution, a rebirth. The next generation of personal computers is arriving. They are powerful, rich in features and low in price.

The question is, where is their niche? Are they high-powered home computers or low-cost professional workstations? What are the applications seen for them and how will they be fulfilled? Can they overcome the industry chaos of the past year and create a rebirth of home computing?

Trip Hawkins of Electronic Arts will explain why he foresees a rebirth in home computing. "A year ago there was confusion ... consumers were being told that their children would soon be total failures, brain dead, if they didn't have a computer. But they weren't told about the features of the computers and what they could do with them," said Hawkins. He will offer perspectives on current and potential markets for these computers, and describe some of the barriers to success that previous machines have failed to overcome.

Two of the powerful new machines — Atari's ST series and Commodore's Amiga — will be described in separate presentations. Details of their design objectives, methodology, implementation, and future positioning will be discussed in "Inside the Amiga Computer," by designer Jay Miner of Commodore-Amiga, and "Design of the Atari 520ST," by Shiraz Shizji

For Your Benefit and Your Company's, Keep Up with Computing Developments!

Attend COMPCON '86, March 3-6

Compcon'86 session

Object-Oriented Database Systems

Mike Stonebraker of U.C. Berkeley will chair the session on "Object Oriented Database Systems" at Compcon'86 in San Francisco.

Stonebraker will also give a presentation on object management capabilities desirable in non-business data processing applications. In "Extending Relational Database Systems with Procedures," he will examine application-specific systems, semantic data models and high-leverage extensions to the relational model and its advantages.

A prototype system built to allow LISP values to reside in a traditional DBMS between program invocations will be discussed by Margaret Butler of Xerox Palo Alto Research Center ("Persistent Objects in LISP"). Using initial performance data for the system, this DBMS approach will be contrasted with other possible persistent support mechanisms. Future research directions to increase the functionality of the system will be examined, including sharing, garbage collection, and performance enhancements.

An object-oriented data model based on the concepts of entity and data abstraction will be presented by Nigel Derrett of Hewlett-Packard. In "An Approach to Object-oriented Data Management," Derrett will discuss the advantages of object-oriented databases, how they may be accessed from an object-oriented programming language, and *Iris*, a prototype DBMS being built at Hewlett-Packard.

MARCH 3-6 **spring**

COMPCON 86

THIRTY-FIRST IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE
CATHEDRAL HILL HOTEL, SAN FRANCISCO, CALIFORNIA

TUTORIALS:

3/3/86 ALL DAY

TUTORIAL 1: Silicon Compilation.

Instructor: Daniel D. Gajski, Assoc. Professor, Dept. of Computer Science, Univ. of Illinois. Has been working in industry and academic on super-computer design, silicon compilation and expert systems for VLSI.

Audience: Experience with VLSI design, CAD or silicon compilation is desirable but not essential.

Introduction: CAD vs. silicon compilation. Myths and metamyths. Market taxonomy: silicon houses and foundries.

Silicon Compilation: Definition, methodology, taxonomy. Examples: Genesil, Concord, GDS, MacPitts, Plex.

Theory of Design: Principles and Levels. Translation, style and optimization. Design process. Expert systems.

Processor Compilation: Models, styles, optimizations. Planning. Module compilation: Weinberger array, PLA, RAM, counter, other microarchitectural components.

Cell Compilation: Parametrized cells. Input description. Layout language algorithms. Placement, routing, symbolic layout.

Future Trends: Intelligent silicon compilers.

TUTORIAL 2: Complex Computer Graphics: Illustrated by Drug Design and Genetic Engineering.

Instructor: Robert Langridge, Director of Computer Graphics Laboratory and Professor of Pharmaceutical Chemistry, Biochemistry and Biophysics, UCSF. Experience includes extensive work in computer graphics in molecular biology and in DNA studies, biochemistry, and biophysics.

Audience: Experience/interest in graphics hardware/software is desirable. Interest in molecular biology is not relevant.

Introduction: Graphics for research in complex, three dimensional objects in molecular biology, drug design and genetic engineering. Description of molecules such as proteins and DNA.

One-Way Data Flow: Computer to image flow for "Illustrations." Raster graphics, complex calculation for "realistic" images: Journal figures, frame by frame movies, slides, etc.

Two-way Data Flow: Computer to image to computer with user interaction. "Real-time" molecular structure manipulation with information exchange, realism secondary.

Graphics Technology: Vector and raster hardware. Software. Computation. Interactive elements: menus, dials, joysticks, etc. Cost. Quality. Speed.

Real-time Interactive Manipulations: Molecule and bond rotation. "Dock" drugs into receptors. Illustrative examples on DNA, proteins and drugs using stereo slides, movies and real-time interaction.

Future Prospects: Integrating numeric, symbolic and graphic computation. Application of AI.

TUTORIAL 3: Issues in Expert Systems: An Overview.

Instructor: Henry Sowizral, Computer Scientist, in charge of studies on temporally based computation including knowledge based simulation and distributed expert systems, Schlumberger Research Center, Palo Alto, CA. Previously, at Rand Corporation, he led a project developing an English-like, rule-based programming language called ROSIE.

Audience: Those interested in managing development of, or working on, expert systems. Prior experience is not essential.

Introduction: When are expert systems relevant? Basic concepts of expert systems: Rules, forward chaining, backward chaining, mixed control regimes.

Knowledge Representation: Representational formalism, rules, frames, semantic nets.

Inferencing: Controlling and using prescriptive knowledge, uncertainty, plausible inference, nonmonotonic reasoning.

Knowledge Acquisition and Learning: Obtaining and internalizing descriptive and prescriptive knowledge, necessary underpinnings for building expert systems that learn.

Explanation and Tutoring: Reasoning history, kinds of explanations, the role of prescriptive knowledge.

TUTORIAL 4: Architecture Issues for High Performance Computing and Proposed Solutions.

Instructor: Yale N. Patt, Computer Science faculty member, UCB and SF State. Active in computer architectural research and teaching. Does industrial consulting on high performance machines and is a principal architect of Aquarius, a heterogeneous MIMD high performance system for symbolic and numeric computations.

Audience: Those interested in high performance computer architecture.

Introduction and Focus: High performance numeric and AI computing. Alternative architectures. Influence of problem domain. Influence of technology. Fundamentals of RISC "style." Data flow. Concurrent control flow.

The Issues: Numbers of, and power in, RISC/CISC processing elements. Correct vs. fast arithmetic. Tightly or loosely coupled multiprocessing. Communication topology. Synchronization. Control. Scheduling. Scalability.

Example Machines: Detailed treatment of key concepts of the following designs: Cedar, Ultra, Eli, Cosmic Cube, Non-Von, Connection Machine, BVM, PASM, TRAC, Blue Chip, Aquarius. Ideas embedded in Cray 2 and HEP.

Models of Execution: Analysis of several models of execution including the Berkeley work in restricted data flow.

Compcon'86 Registration Forms are on page 3.

FOR FURTHER INFORMATION:

General Chairman, Glen G. Langdon, Jr., IBM Dept. K54/802, 650 Harry Road, San Jose, CA 95120-6099, (408) 927-1818

Preliminary Program

9:00 Tuesday, March 4

Computer Society Awards

9:30 Plenary Talk

Current Events in the Application of AI Technologies

Dr. Thomas P. Kehler
Executive Vice President, Intellicorp

Compcon'86 session

Belady: Japanese and Software — A Good Match?

Les A. Belady will discuss the Japanese approach to software engineering in a plenary talk at Compcon '86, March 3-6. He will also explore the problems of adapting Western computers to the Kanji, or Chinese character set — problems of retrofitting complex systems to make them usable in Asia.

Belady spent a year and a half in Tokyo, forming and directing a software research effort. He found three major characteristics of the Japanese method contrast with the American software engineering: sharp separation of planning and implementation; willingness to do everything well, even if it is boring; and strong motivation to cooperate with each other.

10:30 - 12:00 Tuesday, March 4

Supercomputers - Maxis to Minis Sid Fernbach

Today's Supercomputers - K. Stevens: NASA/Ames Research Center
The IBM 3090 Vector Computer System- F. Moore: IBM
The CDC Cyber 180/990 - R. Langley: Control Data Corp.
The High-End Japanese Mainframe Machines P. Zidek: Control Data Corp.
The Superminis Today and Trends for the Future J. Dongarra: Argonne National Lab

Unix Portability Jim Warren

Portability Under Unix - and the Lack Thereof R. McClure: Unidot

What Do Copyrights and Patents Protect? Alan Smith

The Expansive Limits of Copyright Protection for Computer Coded or Micro Coded Programs - J. Brown:Brown and Bain
The Copying of Comperable Programs under the Copyright Law - K. Liebman: Irell & Manella
The Scope of Software Copyright: Is "Program Design" Protectable? - S. Katsh: Weil, Gotshal and Manges
Distinguishing Legitimate Reverse Engineering from Chip Piracy Under the Semiconductor Chip Protection Act. - R. Stern

Compcon'86 plenary session

Developments in Application of Artificial Intelligence

Dr. Thomas P. Kehler of Intellicorp will discuss "Current Events in the Application of AI Technologies," in a major plenary talk at Compcon '86.

In the early years of computing the goal was to amplify man's ability to calculate. Later, database technology leveraged the ability to store, manage and retrieve information. Today, knowledge systems techniques provides means to amplify our decision-making and thinking processes.

Numerous organizations are developing knowledge systems that capture, communicate and interpret expert knowledge. Example areas where this new technology is making a significant impact are: manufacturing planning, equipment repair and diagnosis, computer-aided design, and resource management. Knowledge systems are improving the way technical information is managed and communicated in large organizations.

Compcon'86 session

Portability Under Unix — And The Lack Thereof

In the brief history of computing, the tradition has been that manufacturer-supplied operating systems "locked" users to a specific vendor. Unix once held promise of changing that trend and becoming a truly universal operating system to almost everyones' benefit.

There is ample evidence that Unix itself is highly portable, having been adapted to well over 200 different computers produced by more than 125 manufacturers. However, no program in binary form can find as many as 10,000 homes in the Unix world. In contrast, a MSDOS program can easily find between three and five million computers on which it can run unchanged. Why is this so? And must it always be so?

These are the issues that will be explored by Dr. Robert McClure in a major, single-speaker session at Compcon'86. Dr. McClure is an international consultant with two decades' experience in porting both systems and applications software across computers.

IEEE COMPUTER SOCIETY

PRELIMINARY CONFERENCE PROGRAM
for the 21st IEEE Computer Society International Computer Conference
(schedule and speakers subject to adjustements)

1:30 - 3:00 Tuesday, March 4

The HP Spectrum Family — Ted Laliotis
(Titles and authors will be announced later.)

Integrated Services Digital Network — Alan Weissberger
ISDN Standards - J. LaBanca Bell Communication Research
Packet Switching on ISDN - F. Burg: ATT Bell Labs
IC Solutions for ISDN - P. Westin: Intel Corp.

Low-cost Typesetting with Microcomputers — Robert McClure
PC Pagination Issues - J. Powers: Interactive Features
Digital Fonts for Low-cost Typesetting Systems
J. Collins: Bitstream

3:30 - 5:00 Tuesday, March 4

Strategic Defense Initiative: The Software Reliability Issue — Jim Warren
Panel Disscusion:
R. Lipton: Princeton Univ., D. Parnas: Univ. of Victoria
G. Nelson: DEC Systems Research Center

ISDN Applications: A Reality Test — Ron Kunzelman
ISDN Field Trials - J. Miller, A. Knapp: Mountain Bell
ISDN Corporate Networking - J. Splear: EDS Corp.
ISDN Terminals, Workstations, and Hosts - R. Amy: IBM Corp.

Knowledge Processing — John Cuadrado
A View of Goal-Oriented Programming - S. Smoliar: USC/ISI
Intelligent Systems for Analog Design - B. Cohen, et al: Octy,
A Knowledge Processing Enviroment in a Logic Programming System - Lynn Ackler: Westinghouse

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8:30 - 10:00 Wednesday, March 5

The MIPS Microprocessor — John Hennessy
A CMOS RISC Processor with Integrated System Functions
J. Moussouris, et al: MIPS Computer Systems
Engineering a RISC Compiler System - F. Chow, et al: MIPS
Operating Systems Support on a RISC
M. DeMoney, et al: MIPS Computer Systems

PC Network Operating Systems — Harvey Freeman
ViaNet: A Distributed Operating Enviroment
B. Johnson: ViaNetix, Inc.
Expanding Capabilities in High-performance Networking
M. Durr: Novell Inc.

USA vs. Japan: Who will win and why — Ed Miller
Your Own Japan Operation for $100,000 - Nothing Down:
J. Gresser: Nutter, McClennen & Fish
The Samurai and the Cowboy: Bushido vs. Macho:
G. Lindamood, Univ. of Maryland

Fifth Generation Architectures — Jim Goodman
Kabu-Wake: A New Parallel Inference Method and its Evaluation - K. Kumon, et al: Fujitsu Laboratories Ltd.
Evaluation of PSI Micro-interpreter - K. Nakajima, et al, ICOT
Aquarius - Y. Patt, A. Despain: University of California

10:30 - 12:00 Wednesday, March 5

The Clipper Microprocessor — Alan Smith
The Clipper (tm) CAD System - Integrated Hierarchical VLSI Design - R. Ryan: Fairchild
Clipper Microprocessor Overview - L. Neff: Fairchild
C Compiler Issues on the Clipper - D. Neff: Fairchild

The Next Generation of Powerful Home Computers — Barry Bronson
The Rebirth of Home Computing - T. Hawkins: Electronic Arts
Inside the Amiga Computer - J. Miner: Commodore-Amiga
Design of the Atari 520ST - S. Shizji, L. Tramiel: Atari

Optical Publishing — David Mastandrea
Creating a Research Environment Using Laserdisc Storage System - A. Mathur: TMS, Inc.
Impact of the Videobook in Electronic Publishing
M. Siegel: Interactive Video Systems
Originating and Finding Data with a Knowledge Retrevial System - G. Kildall: Activenture Corp.

Fifth Generation Languages — Alvin Despain
MENDEL: Prolog Based Concurrent Object Oriented Language - S. Honiden, et al: Toshiba Corp.
Garbage Collector with Area-Optimization for the Facom Alpha - M. Niwa, et al: Fujitsu Limited
A New Optimization Technique for a Prolog Compiler
S. Abe, et al: Hitachi Research Laboratories

1:30 - 3:00 Wednesday, March 5

New Architectures for High-Performance Computer Execution — Yale Patt
ROPE: Ring of Prefetch Elements - A. Nicolau, K. Kartous: Cornell University
HPS: High Performance Substrate - Y. Patt, UCB
SMAM: Structured Memory Access Machine - E. Davidson, Univ. of Illinois

Low-cost Packet Radio Networking — H.S. Magnuski
The Stanford Packet Radio Network
M. Flynn, et al: Stanford Univ.
An Inexpensive Megabit Packet Radio System
R. Bisbey, et al: USC/Information Sciences Institute
Public Domain Packet Radio Networks
H.S. Magnuski: Gamma Technology

CAD/CAM Data Base Management — H. Randall Johnson
Knowledge Base Management for CAD/CAM
H. R. Johnson: Boeing Computer Services
The Architecture and Prototype Implementation of an Integrated Manufacturing Database Administration System - S. Su, H. Lan, et al: University of Florida
Design Evolution and History in an Object-Oriented CAD/CAM DBMS - G. Landis: Mosaic Technologies, Inc.

Light Industrial Robotics — Curt Nehring
An Example Industrial Robotic Application and Interfaces
A. Soghikian: Intelmatec
Flexible Assembly Works: C. Jennings: Adept Technology
The Disposable Robot: G. Wallace: Robotic Systems International
Low-cost Robotic Solutions for Electronics Industry
R. McCleod: Microbot

Special Compcon'86 Panel

A First: Discussion of SDI's Technical Feasability At a Major Computer Professional's Conference

For what is believed to be the first time, proponents and opponents of the Strategic Defense Initiative — the "Star Wars defense" — will discuss and debate its technical issues at an international conference sponsored by the world's largest organization of computer professionals, Compcon'86. There will be four participants:

Two panelists are members of the Secretary of Defense's "SDI Panel" — the Summer Study Panel on Battle Management reporting to the Secretary's SDIO office. They are Prof. Richard Lipton of Princeton University and Dr. David Mizell, who has just left the Office of Naval Research to join the Information Systems Institute in Marina Del Rey, California. These participants were chosen by members of the SDIO's SDI Panel to participate in this discussion.

The other two panelists are Prof. David Parnas from the University of Victoria in British Columbia, and Dr. Greg Nelson from Digital Equipment Corporation's Systems Research Center in Palo Alto, California. Originally, Prof. Parnas was also a member of the Department of Defense's SDI Panel, but withdrew and has become a leading voice, critical of SDI. Dr. Nelson co-authored "The Star Wars Computer System" with Dr. David Redell, also of DEC's SRC. This is perhaps the best-known criticism of the technical feasability of SDI.

This panelists will limit their discussion to the *technical issues* surrounding SDI software and systems feasability. This session will *not* address social, political or moral issues.

The moderator will be Jim Warren. This SDI Panel session will be followed by a social hour open to all Compcon'86 attendees, offering a light buffet and wine-tasting.

MARCH 3-6 **Spring**
COMPCON 86
THIRTY-FIRST IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE
CATHEDRAL HILL HOTEL, SAN FRANCISCO, CALIFORNIA

Compcon'86 Registration Forms are on page 3.

3:30 - 5:00 Wednesday, March 5

The Great Risc vs. Cisc Debate — Yale Patt

Panel Session:
J. Hennessy, Stanford Univ. — D. Jensen, CMU
E. Davidson, Univ. of Illinois — N. Tredennick, IBM
F. Carruba, Hewlett-Packard Labs

Non-Traditional Applications of the Electronic Spreadsheet — Blake Hannaford

Spreading the Spread Sheet: A. Kay: Apple Computer Corp.
The Electronic Spreadsheet: A Workstation Front-end to Parallel Processors - B. Hannaford, UCB

Object Oriented Database Systems — Mike Stonebraker

Persistent Objects in LISP - M. Butler, Xerox PARC
An Approach to Object-oriented Data Management N. Derrett: Hewlett Packard Labs
Extending Relational Data Base System with Procedures M. Stonebraker: University of California

Digital Broadcasting on Radio, Television and Cable — Dennis Waters

Information Services for PCs Broadcast over Cable - G. Bennington: Telecommunications, Inc.

8:30 - 10:00 Thursday, March 6

US Efforts towards Supercomputers — Paul Schneck

Activities of the Federal Coordinating Committee for Science - J. Decker: DOE/Office of Energy Research
DARPA Strategic Computing Initiative - C. Fields: DARPA
The Supercomputing Research Center - P. Schneck, Institute for Defense Analyses

Software Quality Metrics — Norm Schneidewind

Panel Session:
R. Signh, Space and Naval Warfare System Command
N. Schneidewind, Naval Postgraduate School
A. Freund, Allen-Bradley Co.

Data Base Machines — Paula Hawthorn

Design Considerations for 1990 Database Machines - H. Boral: MCC
The Anatomy of the Database Computer, Revisited - P. Neches: Teradata, Inc.
A Database Machine for Local Area Networks - P. Hawthorn, E. Simon: Britton-Lee, Inc.

Designing with Gallium Arsenide Components — Steve Long

Commercializing GaAs LSI: L. Tomasetta - Vitesse
Managing the Multiple Component Problem for Large GaAs Systems - S. Nelson: Cray
Viable Realization Issues and Lessons learned for GaAs Ultra Speed Micro Systems Design: W. Moyer - RCA

Compcon'86 Registration Forms are on page 3.

10:30 - 12:00 Thursday, March 6

New Computing Alternatives — Creve Maples

The Architecture of the Alliant FX/8 Computer B. Perron, C. Mundie: Alliant Computer Systems Corp.
Applying Parallel Processing - M. Squires: Sequent Computer

Manufacturing Automation Protocol - Plans, Products, and Applications — Dan Lynch

MAP in the Factory - R. Keil: GM Technical Center
MAP Implementation and Performance Issues J. Green: Industrial Networking Inc.
Testing and its Role in MAP Realization - K.H. Muralidhar, A. McMillan: Industrial Technology Institute

Concurrency Control — Hamid Pirahesh

Distributed Multi-version Optimistic Concurrency Control for Relational Databases - D. Agrawal, et al: State University of New York
Optimal Processing of Simple Queries in Ring Networks G. Gursel: San Diego State University
Concurrency Control in a Distributed System and Its Performance for File Migration and Process Migration - A. Hac: John Hopkins University

VLSI Test Capabilities — John Zasio

Real World Built-in Test for VLSI - D. Resnick: ETA Systems
Simulation Studies of Complex Fault Models in Digital Logic S. Mourad, et al: Stanford University
An Automatic Test Generation System for Large Scale Gate Arrays - P. Aikyo, K. Hatano: Fujistsu MicroElectronics

1:30 - 3:00 Plenary Talk

Japanese and Software - a good match?
Les Belady, Vice President, MCC

3:30 - 5:00 Thursday, March 6

The New Wave of Affordable Super-minis / Mini-supers — Jack Dongarra

The Convex 64 bit Supercomputer System - S. Wallach: Convex
Parallelizing Large Existing Programs - Methodology and Experiences - S. McGrogan: Elxsi
The Architecture of the Culler 7 - W. Lichtenstein: Culler Sci.

Should Computer Science Curriculum be Accredited? — Thomas Cain

Panel Session:
G. Engel, Univ. of Conn, — Y. Patt, UCB
G. Lawler, UCB, — T. Booth, Univ. of Conn.
E. Lee, Pro-Log Corp., — D. Bjorson, Boeing Corp.

User's Experience with Silicon Compilers — John Murray

Custom IC for Linear Detection S. Amurthy, J. Southard: High-Tech Seminars
Compiling a Music Signal Processor - D. Rossum: E-MU Systems
Using Silicon Compilation in a Commercial Product Development Project - N. David: Xerox

Impact of Micro Computer Technology on Navigation — Fred Clegg

A Novel Approach to Automotive Navigation and Map Display S. Honey, W. Zavoli: Etak Corp.
Microprocessor Impact of Architecture and Performance on GPS User Equipment - C. Ould: Tau Corp.

Low-Cost Packet Radio Networking

Low-cost digital communications technology has facilitated the design and evolution of budget-minded packet radio networks. Packet radio networks for hobbyists, small commercial and government operations, and frugal educational applications are now a reality.

Microprocessor technology spawned several types of radio-oriented terminal node controllers which serve the function of packet assemblers and disassemblers. A complete packet radio station can be purchased for under $500, including everything but the computer or terminal equipment. New digital circuitry has made possible advanced rf modems for these networks.

The speakers in this Compcon '86 session, "Low-Cost Packet Radio Networking," will discuss current projects related to the networks they are building. They will describe the utility of non-military oriented, highly cost-efficient, radio based networking.

"The Stanford Packet Radio Network," will be discussed by Michael Flynn of Stanford, followed by Richard Bisbey of USC/Information Sciences Institute with "An Inexpensive Megabit Packet Radio System." Session chair Dr. H. S. Magnuski of Gamma Technology will present "Public Domain Packet Radio Networks."

U-Print Upgrade

Digital Devices' Universal Printer (U-Print) interface product line has been upgraded and expanded. U-Print Model A, for use with Atari, and U-Print Model C, for use with Commodore, enable home computer users to add printers manufactured by almost any other company to their units.

Suggested retail price for the U-Print A and U-Print C is $89.95.

DIGITAL DEVICES' U-PRINT MODEL A64

For more information, contact: Charles Frazier, Digital Devices Corporation, 430 Tenth Street, #N205, Atlanta GA 30318, or phone toll-free (800)554-4898.

REPORT GENERATOR ANNOUNCED

DLC recently announced the addition of a Report Generator to its line of software. This report generator can be used with many software programs on the market today. Key benefits include ability to pull data from a data base and produce custom reports. You can add, subtract, multiply, and divide, calculate percentages and deviations and create new reports.

DLC, 6341 S Troy Circle #E, Englewood CO 80111, (303)790-8193.

The "Real" Micro-to-Mainframe Communications Problem

Despite all the hoopla surrounding the growth of micro-to-mainframe communications, a major barrier to continued market expansion is the inability of vendors, MIS personnel and end-users to communicate on the same wavelength. A key finding of International Resource Development's (IRD) newly published 150-page report on micro-to-mainframe communications markets is that end-users mistakenly believe that implementing a micro-to-mainframe link is as easy as 1-2-3, while MIS personnel are so worried about the technical problems that they may be holding back implementations. This leaves micro-to-mainframe vendors between a rock and a hard place trying to serve two masters with differing sets of knowledge and needs.

Although the overall outlook for the growth of the micro-to-mainframe software and hardware market is good, barriers remain that will inhibit the growth of the market during the next two years. The divergence in expectations regarding micro-to-mainframe solutions and an over-emphasis on technical issues constitute major barriers to short-term growth in this market. Generally, end-users are applications-oriented, while MIS personnel have a technical orientation; the latter, therefore tend to focus on technical problems. This focus on technology also arises because many MIS departments and end-users do not yet know precisely how they are going to use micro-to-mainframe technology or whether or not they even ought to be using it. In many organizations data transfer and manipulation is seen as an end in itself rather than as a means to an end — the development of business applications. Since they are not sure how they will use the data once they get it, MIS personnel must deal with how the data will be accessed and transferred as well as the security and data synchronization implications. Not only do these concerns all tend to boil down to technical issues, but customers also expect the solutions to come entirely from the vendors.

IBM's Critical Role

Although IBM so far has not taken an aggressive position in the micro-to-mainframe market, this will begin to change. That is not to say that Big Blue has sat idly by and done nothing. Nonetheless, its attempts to date, the 3270 PC and AT/370 come to mind, have met with indifference. However, it is reasonable to assume that IBM's lackluster performance is probably more attributable to its own ambivalence toward the PC and its proper role in corporate date networks than to any lack of interest in the concept of micro-to-mainframe communications.

Recent announcements indicate that IBM has reached an internal consensus regarding the integration of PC's into its mainframe environments — PCs will be subordinate to mainframes whenever possible. The promised integration of IBM's newly announced token ring LAN with SNA as well as the development of LU6.2 reinforces this view. Any new products that IBM introduces for micro-to-mainframe communications can be expected to generate, at least indirectly, the need for more mainframe processing power. While IBM wants to sell both PC's and mainframes, it makes more money in mainframes.

Growth and Opportunity Despite Impending Shakeout

The more vigorous entry of IBM and the participation of a larger number of suppliers ranging from mainframe software houses to LAN vendors all points to a probable shakeout in this market. The primary problem is not that there is not enough business (sales of micro-to-mainframe software and hardware are expected to grow from $450 million in 1985 to $5 billion in 1990), but rather the lack of differentiation in products and overly technical focus that is prevalent. Because the market is in a state of flux, everyone is trying to find the winning combination by copying the most recent successful product and/or offering anything and everything. Although there are complex technical factors such as security, data synchronization and application bridges to be solved, the primary issue vendors must focus on (and the one most likely to produce long-term satisfying results) is bridging the communications gap that exists between themselves, MIS departments and end-users.

The report was based upon an analysis of the market and trend data in IRD's research database, augmented by direct interviews with more than 40 major end-users and numerous vendors.

Free descriptive literature including a detailed table of contents on the $1,850 report (#680) Micro-to-Mainframe Communications is available from International Resource Development Inc., 6 Prowitt Street, Norwalk CT 06855, (203)866-7800.

Micro-Mainframe Software Product Generations

Characteristic	1985	1990	1995
Open/Closed Architecture	Mixed	Separate	Separate
Security	Poor/Fair	Good	Good
Application Front-Ends	Few	Many	Ubiquitous
Modular Architecture	None	Common	Common
Bulk Data Handling	Little	Common	Integrated
Distributed Data Bases	None	Few	Some?
Micro Interface	Program	Operating System	Operating System
Program to Program Interfaces	Little	Some	Common

(Source: International Resource Development Inc.) (#680)

Compcon86 session

Integrated Services Digital Network — Finally

Integrated Services Digital Network (ISDN) has become a reality. ISDN pilot programs were established in Italy, UK, Germany and France. Illinois Bell, Mountain Bell, Wisconsin Bell, NYNEX, and other U.S. telephone companies will have ISDN field trails this year. AT&T Communications has committed to ISDN by 1987, while all major central office switch, PBX, and IC manufacturers are planning to offer ISDN products. There can be no doubt about ISDN's accelerated development in the coming years, due to advances in digital telecommunications technology, increased diversification of end user information types, and international standardization.

But what does ISDN really mean and what are the applicable standards? What services and supplementary services are likely to be offered in the U.S? How will AT&T Communications' network evolve? What type of chips will be required to realize a cost effective ISDN interface? These questions and many more will be examined in this critically important session.

The session, "Integrated Services Digital Network," will be offered at Compcon '86 in San Francisco, March 3-6. It will begin with an introduction by chair Alan Weissberger of Teledimensions, followed by "ISDN Standards," presented by J. LaBanca of Bell Communication Research. Fred Burg of AT&T Bell Labs will discuss "Packet Switching on ISDN," and Pat Westin of Intel will explore "IC Solutions for ISDN."

Compcon'86 session

Design of Fairchild's Clipper Processor

The Clipper microprocessor will be discussed at Compcon '86 in San Francisco, March 3-6. This is a high-speed 32-bit microprocessor developed by Fairchild.

Laura Neff will describe the features of the processor and its associated cache chip. Neff will also discuss software issues faced in developing CLIX for the Clipper, an operating system based on UNIX System V.

Requirements of the Clipper project were such that faster, more reliable tools were needed to implement an integrated hierarchical approach to design. Ray Ryan will discuss design control and data management; design structures for logic design, routing, and mask generation; and design validation through mixed functional and gate level simulation.

Design issues of a recently completed C cross-compiler for the Clipper will be discussed by David Neff. The Clipper architecture's opportunities for performance improvements included programming constraints typical of large mainframes. Neff will describe issues involved in porting two C compilers under these constraints.

Neff, Ryan and Neff are all from Fairchild. This session will be chaired by Alan Smith of U.C. Berkeley.

GIANTS, COMEDIANS ...

continued from page 6

victims, personally, I've watched — and been angered by — these journalistic excesses.

"Awful" Adam

First, there was Adam Osborne. If one accepts the media commentary, he went from "visionary entrepreneur" to "arrogant, elitist failure" in only a few years. Both views are violations of "Truth in Labeling."

There were many who enjoyed, and many who were offended, by Adam's vigorous pontifications. The press breathlessly parroted his views, when he was riding high. Then, they too-eagerly trampled on Adam and Ego, when he dared to err.

Yet, errors are an essential part of our unpredictable industry. We should encourage entrepreneurs to risk mistakes while pursuing better deeds. And, *we should encouarge — rather than discourage — them to report their progress and plans, even when unproven or incomplete.* It provides worthy sharing and inventive stimulation for us all.

Adam's credits remain: He is one of microcomputing's best writers. He was the first to promote free software, underwritten by sale of the software's documentation. He introduced the first transportable computer. And, now, he's promoting direct, mass distribution of lowcost software — pushing it uphill against the fickled press' poundings.

Asilomar query: *"Does the destruct benchmark do the obvious thing?"*

Job's Journey

Then there's Steve Jobs. If you believe the press, Steve went from several years of being the darling of the business pages, and "the inventor of the personal computer," to a "super-rich, aging spoiled brat [who hasn't] taken the time to learn to speak English" (latter quote from a major west coast newspaper's business section).

Awww, com'on, folks — is this business section columnist

continued on page 14

THE MIPS MICROPROCESSOR

RISC research was initiated at Berkeley, Stanford, and IBM Yorktown in the late seventies and early eighties. Bringing the RISC research from an academic to an industrial environment required examining issues such as virtual memory support, integration with cache systems, and developing a full set of languages with the necessary instruction set support.

"The MIPS Microprocessor," a session offered at Compcon '86, March 3-6 in San Francisco, will examine how these issues were attacked in the RISC processor developed by MIPS Computer Systems. This processor is capable of sustained execution at a rate of five VAX mips using a high-performance pipeline and tightly integrated systems coprocessor.

The first presentation will be "A CMOS RISC Processor with Integrated System Functions," by J. Moussouris. A discussion of the development and integration of an optimizing multi-language compiler system will be presented by F. Chow in "Engineering a RISC Compiler System." In "Operating Systems Support on a RISC," M. DeMoney will address the balance of functionality between hardware and software in the support of the operating system. The session will be chaired by John Hennessy of Stanford University. Moussouris, Chow and DeMoney are all from MIPS Computer Systems.

Videodisc And Optical Disk Update

Videodisc and Optical Disk Update is now available on NewsNet, the online database of specialized business newsletters.

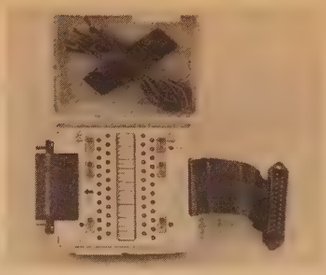
Published by Meckler Publishing, this biweekly newsletter provides its readers with current news on developing optical-based information systems. Videodiscs, optical disks, and CD-ROMs are included.

For each technology, Update covers recent technical developments, software announcements, courseware, personnel changes, calendar items, and conferences. Other features include new product releases, market research summaries, contract announcements, and foreign developments.

NewsNet delivers business news on over 30 industries and professions — from aerospace and investment to taxation and telecommunications. Both current and back issues are online in full text. The database of nearly 300 services is available to anyone with a communications terminal or microcomputer.

Marcia Cheetham, NewsNet, (800)345-1301.

BREAKOUT BOX



Datacom Northwest has announced the availability, from stock, of the Model 15 Mini Breakout Box.

The Model 15 Mini is a tough, compact (3-1/4" x 3" x 1") Breakout Box that fits in a shirt pocket. And, has most of the features that are in larger, more expensive units.

The line powered Mini has full RS232 breakout and probe points, 24 center mounted dip switches with a cabled male connector on the left.

Jumper wires and illustrated User Manual are included. The Mini's suggested retail price is $79.95. For additional information, contact: Datacom Northwest Inc., 3303 112th St SW #100, Everett WA 98204 (206)355-0590.

The Latest in Database Machines

The Compcon '86 session on "Database Machines" will explore the design and use of these single-purpose computer systems. It will focus on how database machines are designed to manage data more cost-effectively than general-purpose computers, how commercial machines differ from those that have been designed in academia, and what the user experience with database machines has been.

Database machines are single-purpose computer systems dedicated to fast, reliable management of data. They are backend machines and network database servers, off-loading front-end machines of data management tasks. This results in much greater availability of the users' front-end machines and faster data management.

"Design Considerations for 1990 Database Machines," will be discussed by Haran Boral of MCC. Philip Neches of Teradata will present "The Anatomy of the Database Computer, Revisited." Session chair Dr. Paula Hawthorn of Britton-Lee will discuss "A Database Machine for Local Area Networks."

Computer Aided Engineering Seminar

Saturday, March 1, 1986 at Stanford University

Another Affordable Seminar from the IEEE Computer Society

IEEE COMPUTER SOCIETY

Who should attend:

- Digital design engineers
- Engineering managers

Level of Coverage:

- No CAE background assumed
- Broad survey

Description: **This seminar provides a excellent framework for the new or prospective CAD tool user to evaluate different vendors of both hardware and software for digital CAD applications. The seminar focuses specifically on motivation, techniques, and system issues, with special attention to design (schematic) capture and simulation.**

Program Chair: **Tom Blank, Stanford University. CAD Lab Manager, Center for Integrated Systems**

Schedule: **(Preliminary)**

8:30-9:00	**Keynote Ed Cheng, Silicon Compilers**
9:00-10:30	**Chuck Williams, ROLM Corp CAD tools (why), CAD as a System (functional components: capture, sim, test, etc), CAE design process**
10:30-10:45	**Coffee**
10:45-12:00	**Tom Blank, Stanford Simulation use, speed, size; libraries, Spice, switch, logic, RTL, behavioral modeling, accelerators**
12:00-1:30	**Lunch**
Hardware Workstations:	
1:30-2:00	**IBM**
2:00-2:30	**Sun**
2:30-3:00	**DEC**
3:00-3:15	**Coffee**
CAE Companies	
3:15-3:45	**P-CAD**
3:45-4:15	**Daisy**
4:15-4:45	**Mentor**
4:45-5:00	**Industry View**

SEMINAR LOCATION

The seminar will be held on the campus of Stanford University, at Cubberley Auditorium, School of Education. Lunch will be served at Tressider Union. See map.

DIRECTIONS

Highway 101

Turn off Hwy 101 at Embarcadero Road, Palo Alto, and head west. This becomes Galvez west of El Camino Real as you enter the Stanford campus. Follow the map to parking, walk to Cumberley Auditorium.

INTERSTATE 280

Turn off IS 280 at Page Mill exit, and proceed east to El Camino Real. Turn left (north) on El Camino Real to Galvez. Turn left on Galvez and enter the Stanford campus. Follow the map to parking, walk to Cumberley Auditorium.

Seating is limited

Early registration is advised: first come - first served

Mail the form with check payable to IEEE SCV/CS to:

IEEE Computer Society
701 Welsh Road, Suite 2205
Palo Alto CA 94304
(408) 327-6622

	Pre-register (by Feb 14)	At Door
☐ IEEE Member No. _____	$40.00	$55.00
☐ Non Members	$50.00	$70.00
☐ Full-Time Students School _____	$25.00	$35.00

Name _____

Address _____

_____

_____

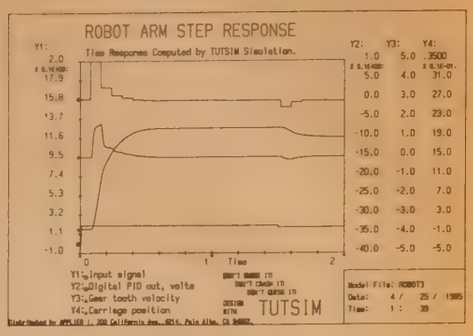
A ROBOT ARM GAINS MUSCLE AND FINESSE

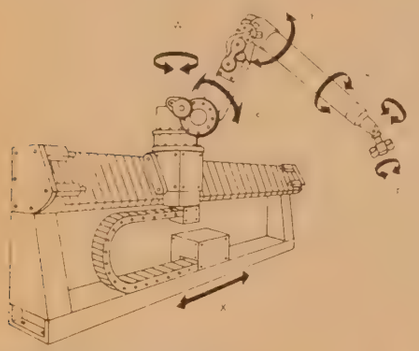
In the advanced industrial world one new laborer is the robot. Unusual in many ways, this new worker has one familiar human feature — an arm that can reach, bend, and grasp. Designers of robots have found that nature's configuration of arm, elbow, forearm, wrist and fingers is an efficient model. Thus the common term of reference for industrial robots is "robot arm."

Arms may range in size from a modest foot-and-a-half that plucks small parts off a conveyor belt to units that reach from 6 to 15 feet, weigh hundreds or thousands of pounds, and process many thousands of dollars worth of products per hour.

A robot arm may rest on a base, hang from a swivel, or travel along a track. The "fingers" may push, grasp, weld, or spray paint. A single arm may be capable of a number of independent motions — like elbow, wrist, and finger joints. These are called "degrees of freedom." Each degree of freedom needs a control circuit. In most designs, this circuit is a servo system.

The speed and accuracy of each servo loop relates directly to the arm's desired capability and thruput, and thus to its industrial application. Design optimization that affects performance by even a few percent can have a large financial impact. Accurate modeling and simulation are among the techniques used for experimentation and for verification of proposed design changes in robot arms.


ROBOT ARM STEP RESPONSE
Time Response Computed by TUTSIM Simulation.
Y1: 2.0 15.8 13.7 11.6 9.5 7.4 5.3 3.2 1.1 -1.0
Y2: 5.0 0.0 -5.0 -10.0 -15.0 -20.0 -25.0 -30.0 -35.0 -40.0
Y3: 5.0 4.0 3.0 2.0 1.0 0.0 -1.0 -2.0 -3.0 -4.0 -5.0
Y4: .3500 31.0 27.0 23.0 19.0 15.0 11.0 7.0 3.0 -1.0
0 1 2 Time
Y1=Input signal
Y2=Digital PID out, volts
Y3=Gear tooth velocity
Y4=Carriage position
TUTSIM
Model File: ROBOT3
Date: 4 / 25 / 1985
Time: 1 : 39



Designing for Good Robots (Modeling for Good Designs)

Good robot arm design calls upon virtually every aspect of the science and art of control engineering. Linear control theory is the basis of good design. However, nonlinear elements abound in actual practice. These elements are best modeled and studied using a continuous simulation system. One of the least expensive, full-capability systems is TUTSIM which runs on microcomputers. This example illustrates the robust capabilities TUTSIM offers to the practicing control engineer.

TUTSIM blocks directly implement the servo system equations in the time domain. The blocks have other implementations, like "dead zone" and "stiction," that are not immediately apparent.

The TUTSIM users first sketch their system in block diagram form. Then, they enter it into the TUTSIM program, a line for each block, somewhat like the spreadsheet programs that are so useful for discrete simulations. With that, and some timing information, the user can can quickly simulate the system and obtain time responses — easily revising the model until it responds in an acceptable manner.

The illustrations show a typical designer's block diagram sketch, a listing of the TUTSIM "program", and some examples of the response of the model. The block diagram shows a typical control loop for one axis of a robot arm. Major sections of the loop include the following:

The Imbedded Digital Controller

This design assumes that imbedded in the control loop is a digital computer element. Often this element is a simple single-chip computer processor that periodically samples inputs and position, calculates error, perhaps performs a PID-type control algorithm — Proportional, Integral, Derivative function — then outputs a new control value. This new value is held until the next periodic recalculation. Typically, this periodic time is some milliseconds, slower than the faster components of the system but faster than overall response.

The TUTSIM Sample and Hold block makes it possible to simulate an imbedded digital computer control. The error in position is picked up by three channels in the simulated digital controller. Blocks 10 and 15 are the gain of a Proportional channel. The SPL block samples the input every (simulated) 80 milliseconds and holds the value for the next period.

The Integrator channel comprises blocks 13, 17, 11, and 16. Most TUTSIM blocks have implied summing inputs. This feature, used on 13, faithfully simulates a digital integrator. Integration adds the new value to the sum of the old values.

The Derivative channel of the simulated PID comprises blocks 14 and 12. The old value, from 80 milliseconds back, is subtracted from the current value.

Gains from the three channels are kept separate for ease in changing parameters between simulation runs. This simple PID model may be augmented by any of the other algebraic blocks. Involved and non-linear algorithms may be implemented. Simple running-mask digital filters or limited cross-correlation techniques may be simulated. Applied i — the exclusive U.S. distributer for TUTSIM — has application notes illustrating that technique.

Frequency-Domain Function Blocks

TUTSIM is primarily designed for input of real component descriptions. However, there are times when the designer would like to specify LaPlace transfer functions directly. Often this occurs in the part of the system that is a linear amplifier and may have the designer's chosen compensation networks.

These specifications can be handled with TUTSIM blocks. An application note is available to help the designer with this technique. Actually, any ratio of polynomials in "s" may be implemented.

In the model shown, blocks 20, 21, and 22 simulate a lead/lag network. The parameters of 20 and 21 are time constants. The simulated amplifier has limited output voltages. The FIO block is a simple single-pole response block. In the example, real values of motor constants are implemented. The shaft of the motor could have been treated as a stiff torsion spring. That effect, however, is ignored in this model.

A virtue of TUTSIM models should be noted: If other physical features need to be incorporated, they can be added simply as more blocks in the model. The existing work need not be scrapped, nor altered — other than sketching in the added blocks and connections and typing the description of the new blocks, much like adding a line to a Basic program.

Deadzone (with Apology to Jerry Garcia)

```
Model File: robot3
Date:    4 /   28 /  1985
Time:   19 :   13
Timing:   0.0010000 ,DELTA  ;   2.0000    ,RANGE
PlotBlocks and Scales:
Format:
     BlockNo,  Plot-MINimum,  Plot-MAXimum;  Comment
Horz:    0 ,   0.0000     ,   2.0000     ; Time
 Y1:     1 ,  -1.0000     ,   2.0000     ; Input Signal
 Y2:    16 ,  -4.0000     ,   1.0000     ; Digital PID out, volts
 Y3:    44 ,  -3.0000     ,   7.0000     ; Gear tooth velocity
 Y4:    47 ,  -0.1000000  ,   0.9000000  ; Carriage position

  0.0100000      1 PLS                          ;Input Signal
  4.0000
  0.2000000
                 2 SUM     1     -47            ;Error
  2.9000        10 GAI     2                    ;PID Proportional Gain
  0.6700000     11 GAI    13                    ;PID Integral Gain
  0.8000000     12 GAI     2     -14            ;PID Differential Gain
  0.0800000     13 SPL     2      17            ;Integral sum and hold
 40.0000        14 DEL     2
  0.0400000
  0.0000
  0.0800000     15 SPL    10      12
-10.0000        16 LIM    11      15            ;Digital PID out, volts
 10.0000
  0.0000        17 ADL    13                    ;History block
  0.0050000     18 PLS                          ;Initializing pulse
100.0000
  1.0000
                19 MUL    18      16            ;initialize at zero
  0.0750000     20 GAI    19                    ;Tx of Lead/Lag
  0.1150000     21 ATT   -22      20            ;Tp of Lead/Lag
  0.0000        22 INT   -19      21
-10.0000        23 LIM    21     -51
 10.0000
  1.3000        24 FIO    23                    ;DR motor TC
  0.0050000
  0.0000
  1.0000        25 GAI    24                    ;Motor amps to torque
  0.0550000     26 ATT    25                    ;Applied force
                27 ABS    26                    ;Applied force
  0.3300000     30 CON                          ;Dynamic Friction
  0.6200000     31 CON                          ;Static Friction
                32 ABS    48                    ;Carriage velocity
  0.0010000     33 REL    30     31      31     ;Stiction
                                32
  0.0000        34 LIM    27     -33
100.003E+09
  0.0000        35 REL    34     34     -34
                                26
  9.3000        40 CON                          ;Arm carriage mass + shaft inert
  0.2100000     41 CON                          ;Effective shaft inertia
  0.0012000     42 REL    40     40      41     ;Effective mass
                                50
                43 DIV    54     42             ;a=F/m
  0.0000        44 INT    43                    ;Gear tooth velocity
  0.0013000     45 LME    44                    ;Backlash zone
[illegible]
  0.0000        46 EUL    44                    ;Gear tooth position
                47 SUM    46     -45            ;Carriage position
                48 DIF    47                    ;Carriage velocity
  0.0000
  0.0000
                50 ABS    45                    ;How far in backlash zone
  0.0000000     51 GAI    44                    ;Tack feedback
  0.6300000     52 GAI    48                    ;Carriage viscus friction factor
  0.1300000     53 GAI    44                    ;Shaft viscus friction factor
                54 SUM    35     -52     -53    ;Sum of forces
```

Gears and loose linkage have a deadzone effect. Whenever applied motion or applied force is reversed, there is some driving effort before the driven elements begin moving. During this time there is little or no load on the driving forces. Many simulation languages find this difficult or impossible to implement. However TUTSIM can simulate this real nonlinear effect:

Normally, velocity is integrated to give position. A variation of that technique, using the limited integrator blocks of TUTSIM, allows a generation of position from velocity that incorporates the elements of deadzones. Also, the correct load may be selected to reflect back the correct mass to the driving force. Blocks 44, 45, 46, and 47 create the deadzone effect. Blocks 40, 41, 42, and 50 cause the correct load to be used in the dynamics.

Friction and Striction

These are always with us. There are actually nine cases when even a simple part slides on another. Forward and reverse force and zero force must be considered. Then forward and reverse and zero velocity modify the effective force.

TUTSIM blocks faithfully simulate these effects. The applied force of block 26 is modified and made an effective force at block 35. The technique is apparent from an inspection of the block diagram.

Total Simulation of Single Axis of a Robot Arm in Just 28 Seconds

All of these elements together give a faithful representation of this important industrial device. The total model is approximately 40 TUTSIM blocks. The block diagram is the designer's work sheet. The description accompanying the TUTSIM program is a listing, usually one line per block. Simulation over a 2 second movement in steps of 1 millisecond takes about 28 seconds on an IBM AT equipped with an 80287 coprocessor. The output of any block may be plotted or interrogated during the simulation run. Position and velocity for a step input are shown. Also note the stepped output from the imbedded digital controller. Any condition be be altered and the response from the change noted.

Application notes covering these major aspects are available from Applied i. They explain how the standard TUTSIM blocks can be used to implement these concepts in each case.

BUILD YOUR IDEAS WITH

TUTSIM

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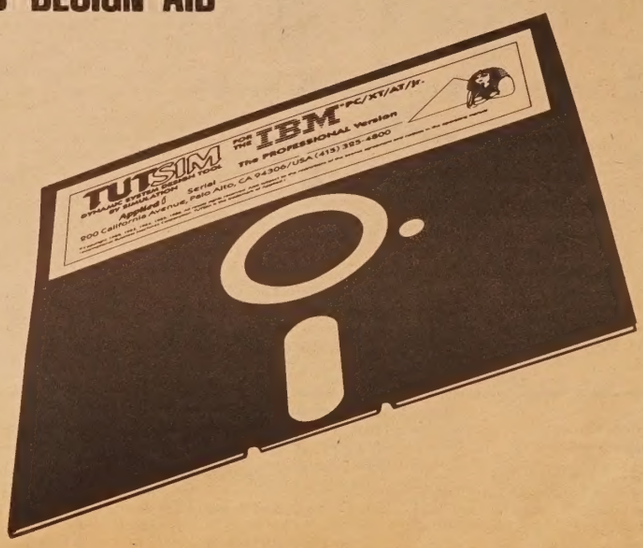
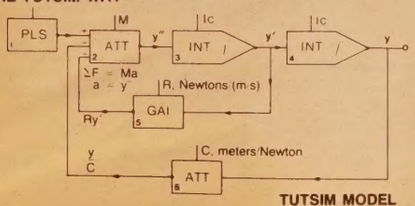
TUTSIM brings block diagrams alive. Model a system, model an equation or an hypothesis. TUTSIM will exercise it and predict the response. Change a block, change a parameter or a concept, and TUTSIM will show the changed result.



THE TUTSIM WAY

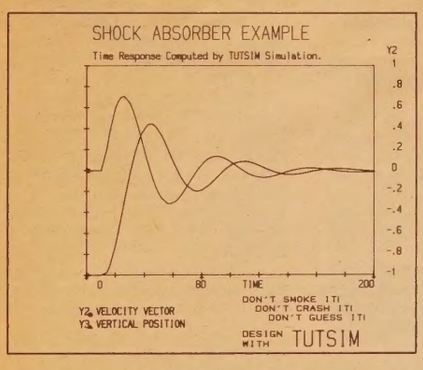


TUTSIM MODEL

TUTSIM MODELS:

CONTROL AND SERVO SYSTEMS • ROBOTICS • FLUID DYNAMICS • THERMODYNAMICS BATCH CHEMICAL PROCESSES ELECTRO-MECHANICS • BIOLOGICAL PROCESSES ECONOMETRICS • DIFFERENTIAL EQUATIONS

THE TUTSIM SOLUTION



TUTSIM VERSIONS

The SHORT FORM
lets the professional evaluate TUTSIM, or allows the student or amateur to learn block diagrams, modeling and simulation. A user can graphically demonstrate calculus, solve differential equations, and become familiar with x-y plots and phase plots. Algebraic, trigonometric, and transcendental operators are made into easy-to-understand and easy-to-use block operators. The mathematical response of simple physics problems can be observed. Logic blocks display solutions to Boolean functions.

The SHORT FORM provides a rare opportunity for the technically interested person to use a truly professional tool that is so clear that even an advanced high school student can understand the principles.

WHO SHOULD BUY THE SHORT FORM?
Professional users who wish to evaluate TUTSIM for advanced use
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High school instructors who wish to demonstrate real engineering techniques
The technically curious who wish to use a software simulation tool for self-instruction

The COLLEGIATE Version
is an intermediate TUTSIM for problem-solving in biophysics, ecology, econometrics, linear and nonlinear differential equations. It is suitable for undergraduate instruction in all those fields.

WHO SHOULD BUY THE COLLEGIATE?
Scientific workers who use rate equations or differential equations in their work and need graphical time domain solutions.
Instructors in engineering, physics and applied mathematics.

The PROFESSIONAL TUTSIM
is the advanced version for professional design and evaluation of linear and nonlinear servo systems, robotics, thermodynamics and chemical engineering. It solves simultaneous differential equations of the nth degree without extensive algebraic manipulation by the user.

PROFESSIONAL TUTSIM has the power of advanced mainframe simulation programs, yet has the ease and speed one expects from the modern microcomputer.

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Professionals who are designing high performance control systems.
Companies whose designs by virtue of volume of units, size of units, or safety, would benefit from optimization of designs by simulation.
Chemical processors with high value or high volume processes where optimization has significant economic impact.
University departments for senior or post graduate engineering, research, or instruction.

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Blocks (Maximum)	15	27	999
Copy Protected	Yes	No	No
PC/XT/AT	Yes	Yes	Yes
Runs IBM/Jr.	Yes	Yes	Not Suited
Memory Required	64K	64K	128K
Use on hard disk	No	Yes	Yes
Supports 8087	No	No**	Yes
Results to file	No	Yes	Yes
Filed data to model	No	Yes	Yes
Graphic Printer Support	Epson	Epson	Epson C. Itoh 8510 Other*
Pen Plotter Support	No	Yes	Yes
CRT modifiable graphics	No	No	Yes*
PROCEDURE BLOCKS FURNISHED:			
Algebraic blocks	All	All	All
Logic blocks	All	All	All
LaPlace functions	No	No	Yes[1]
User written functions	No	No	Yes[1]*
Frequency response	No	No	Yes[2]
Real Analog I/O	No	No	Yes[1]*
Updates for 1 year available	No	No	Yes
Technical Support	Will be provided by manufacturer		
Classroom License	No	Yes	Call
Extra Manuals	No	Yes[3]	Yes

* An additional fee will be charged for source code that will allow the user these capabilities
** May be purchased for additional $40.
[1] Available 4th Quarter 1985
[2] Currently available by purchasing PC-MATLAB at an additional cost (Requires an 8087)
[3] Available with classroom license.
Call for information on Apple II and CPM/80.

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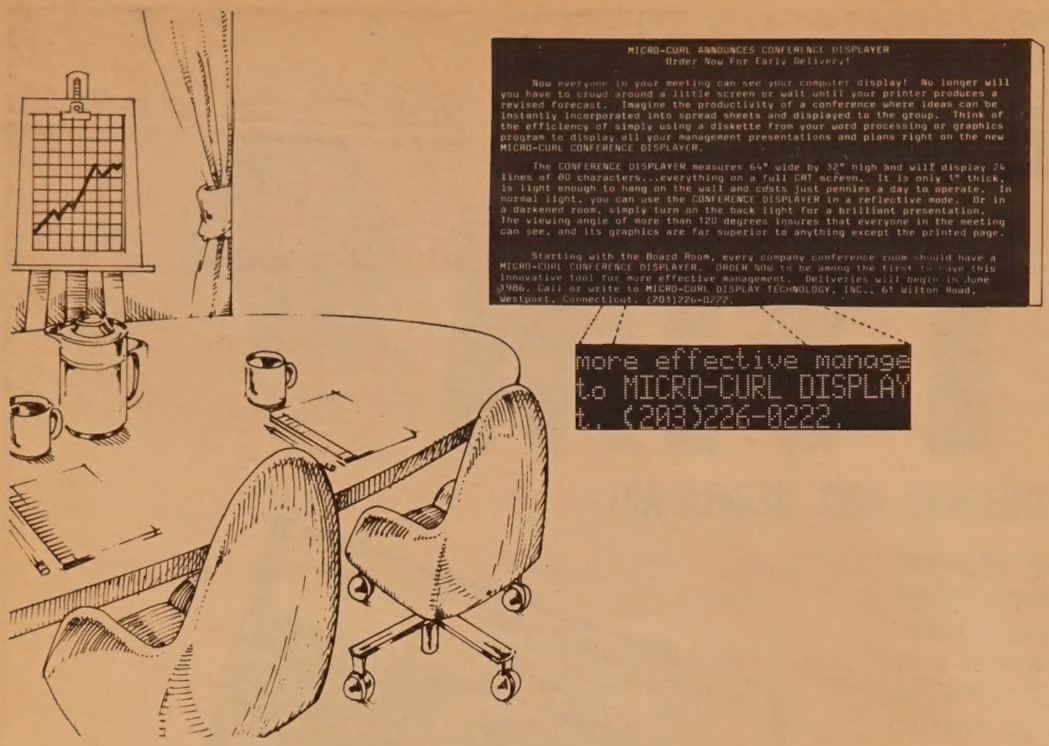
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Micro-Curl Conference Displayer may be used in conference rooms and classrooms. This wall-mounted 32" by 64" display is composed of 32 modules mounted in front of a light diffuser box. It clearly displays images of information generated on an IBM PC or other personal computer. For details, contact; Micro-Curl Display Technology, Inc., 61 Wilton Rd, Westport CT 06880.

— WANT ADS —

DIABLO 630: daiseywheel printers ($1200)

ALPHA MICRO — powerful S100-based microcomputer time-sharing system with 64K-1MB memory, 6-32 user ports: AM100 CPU ($200), memory ($200/64K), user ports ($300/6), 10MB CDC cartridge drive ($1000), 90MB CDC cartridge drive ($3000), Wango dual 8" floppies ($200), extensive software (free with system). All or parts.

MICROMATION MARINER: M/PM-based 4-user S100-bus system, four 8080 boards with 64K on each, 21MB Fuji winchester, 8" floppy, 3M tape backup, classy designer cabinet, recently checked out. $3,000

CAL.COMP.SYS.300: S100 system, 8080A, 64K (more can be added), two 8" dual-density floppies, C/PM software. $1,000

DATAMAC: 64K, two 5" floppies, as is (may work); C/PM,Pascal,Wordstar. $200

GE TERMINET: 120-column, 1200-baud hardcopy terminal, as is (might work). $200

S100 BOARDS:

Dual 68000 CPU, $300
Konan SMD-type disk controller. $400
Potomac Micromagic modem board. $200
Piiceon memory. $200/64K

MISC:

DTC Microfile memory board. $100
XEROX 2350: reducing copier. $900
XEROX 2830: 11"x17" copier. $1000
DESKS: Metal and wooden. $100

WALKIE TALKIES: five industrial-grade Wilson HH-464-D4 units and base station, remote phone interconnect, extra batteries, five rechargers. $7000 includes licensing

TYPESETTER — IBM ELECTRONIC SELECTRIC COMPOSER: like a typewriter but with memory, proportional horizontal and vertical spacing, justification, 20 type fonts (medium, italic and bold; 8 point to 12 point), a main workhorse unit for small print shops for decades (used for years to create People's Computer Company newspaper, Dr. Dobb's Journal, and years of Infoworld and the SGG). $4000

NEWSPAPER TYPESETTERS — AUTOLOGIC MICRO-5: computer-driven newspaper typesetters (the LA Times uses four — two on-line, and two as back-up), 1000 lines-per-minute, hundreds of fonts available, 6 point to 72 point in 1/10th point steps, characters generated on hi-res CRT, new cost is $60,000-$80,000 or more. One has 5MB winchester for font storage ($30,000, FOB Woodside, CA), other has 20MB winchester ($35,000, FOB Denver, CO).

MERCEDES SL's: sports coupes, gray '65 230SL ($12K), brown '70 280SL ($14K).

All items FOB Woodside, Calif., prepaid or COD. Some "as is"; some guaranteed to work. Call Jim Warren at (415)851-7075.

GIANTS, COMEDIANS ...

continued from page 11

really denigrating wealth and age? Is Steve the only 100-millionaire who is a spoiled brat? And, if the columnist is fair, I can hardly wait to read his acrid comments about "pahk tha cah" Boston business barons and yo'all's Texas' backwoods billionaires.

While we're at it: There were thousands of micros in personal use, a year or two before the first Apple was prototyped. And, Woz — Steve Wozniak — was the designer and builder of the Apple-I and its ROM-code, with occasional assistance from then-friend Jobs.

Again, to give due credit: Led by Jobs, Apple had the good sense to bring in mature manufacturing talent (Mike Markkula) when the rest of our infant industry greedily clutched its stock options to itself. The Apple was given a flashy, futuristic designer skin — appropriate for a consumer market — while others only built boring boxes. Jobs bulldozed the Lisa and Mac into existance. They were logical extensions of X-PARC's internal workstation, the Alto. But, with most of a decade's lead, wealthy, mature, sophisticated, business-wise Xerox never got around to offering an Alto-like personal computer. (Does anyone remember the boring personal computer trinket that Big X offered, a few years ago?)

Beware — The Press

This is not to say that Adam hasn't earned some criticism, given some of his more

continued on page 16

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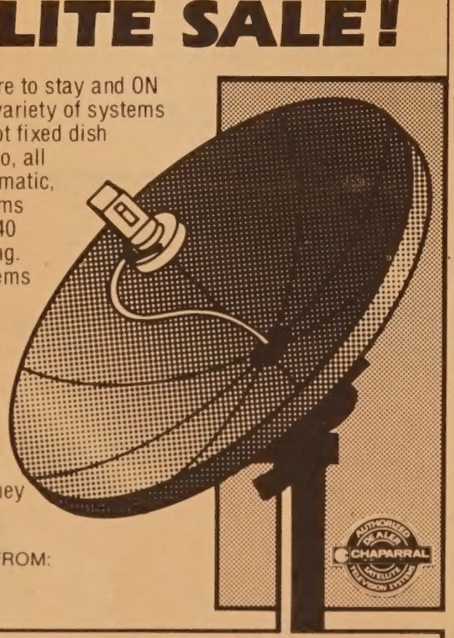

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Compcon'86 session

ISDN Applications — The Reality Test

Integrated Services Digital Network (ISDN) is a major new telecommunications architecture that will supplant traditional voice and data networks. A major feature of ISDN architecture is the use of twisted pair telephone wiring to deliver integrated voice and data communications to the desktop.

A great deal of hype surrounds ISDN, the fervor sometimes approaching the level of a religious frenzy. But in spite of this enthusiasm, there hasn't been a lot to show. Consequently, many people are asking whether ISDN is real.

The Compcon '86 session, "ISDN Applications—The Reality Test," will discuss early applications and field trials currently underway.

To help understand how ISDN will initially be deployed, this session will focus on issues such as the ISDN terminals, workstations and hosts that are likely to be available in the next one to three years, the kinds of Central Office based services to be offered in the upcoming ISDN field trials, and the plans of a major corporation with regard to ISDN based private networking. Others issues of concern include questions regarding who really needs ISDN, whether it will offer reduced costs or increased capabilities compared to currently available digital voice/data PBX's, and whether a user should rent services from the local telephone company or use a private ISDN network.

Participants of this session are Joseph Miller of Mountain Bell, who will discuss "ISDN Field Trials"; Jim Splear of EDS Corporation on "ISDN Corporate Networking"; and Robert M. Amy of IBM presenting "ISDN Terminals, Workstations and Hosts." The session chairman is Ron Kunzelman of Rolm.

Compcon'86 session

User Experiences with Silicon Compilers

Silicon compiler users who are developing commercial or military products will discuss their experiences at Compcon '86.

Topics include: Motivation for using silicon compilation; organizational and perceptual changes brought about by using silicon compilers; current projects/architectures being implemented via silicon compilation; system design processes in the user's environment; conceptual framework of users — architects, IC designers, software and hardware folks; general experiences with silicon compilation, including impressions, strong/weak points, chip area utilization, performance, power, design cycle times; and, future needs surrounding silicon compilation.

"Custom IC for Linear Detection" will be presented by Malaiperumal Sundaramurthy and Jay Southard. "Compiling a Music Signal Processor" will be discussed by Dave Rossum. Nancy David of Xerox will present "Using Silicon Compilation in a Commercial Product Development Project." The session will be chaired by John Murray of DEC.

About Balancing Free News with Lowcost Publicity

by Jim Warren, Editor/Publisher

The *Gazette* is an experiment in alternative publishing.

It is neither a "real" trade newspaper, nor is it a house organ — a captive periodical belonging to the folks who pay for its publication and distribution.

Legitimate Trade Periodicals

A real trade pub has a real editorial staff and publishes articles about a variety of products — and has a mob of advertising hustlers.

Trade publishing is expensive. That makes access to it expensive. It costs *lots* for entrepreneurs to publicize their ventures. Thus, they provide little detail about their products — sad for them; frustrating for readers. *Most micro mags have significant subscription fees.*

[I started two such rags. One was microcomputing's first regular newspaper — later sold and renamed INFOWORLD. The other was DATACAST — the first to offer in-depth software tutorials. In both cases, I found I didn't like ad hustlers and ad hustling.]

Captive Company Rags

In contrast, a house organ is almost invariably devoted *exclusively* to promoting that company's products. Too often, such company newsetters are edited by non-technical p.r. writers and filled with trivial puff pieces, carrying little information of technical depth. Or — somewhat better — they are written by a technical wizard who is an *awful* writer. Either version offers the reader appeal of a Roto-Rooter advertisement or a tech manual. *House organs are usually — but not always — free.*

(Chris Morgan's LOTUS magazine illustrates an outstanding exception to these criticisms. Published by Lotus Corp., it is an absolutely excellent house organ, equivalent to the best of trade magazines — and costs $18/year.)

The *SGG*— Free to Readers; Inexpensive for Underwriters/Advertisers

For nine years, we have balanced between real newspaper and house rag. We have readable writers and a technically competant editor [at least, that's a delusion I maintain]. We cover a variety of topics, providing a broad range of content to fairly serve our readers.

We balance articles having nothing to do with paying clients, with underwriter's ads and articles that provide much greater detail about the client's offerings than is possible in the more expensive spreads.

And, the Silicon Gulch Gazette *is free to its recipients.*

We're up front about the reader/underwriter trade-off. E.g., this issue was obviously produced to publicize the IEEE Computer Society's Compcon'86 — implied by the front-page address, dateline, content subheads; and specifically stated in the page-4 staff box.

Adamantly Independent — An Uppity Publisher

One other thing: We maintain editorial independence from our clients. They don't control the content that does not pertain to them, and they are neither to be blamed nor praised for the result.

We are only interested in underwriters who offer fair, equitable support to their customers; provide reputable products; and offer us accurate ads and useful technical articles about their ventures.

[Thanks to peddling the Computer Faire for more loot than I ever dreamed of havin', we can be disgustingly picky — Utopia for a consumer advocate and opinionated editor!]

How Are We Doing? — We'd Like Your Opinion

Although this issue was sent to the IEEE's mailing lists, about 125,000 names are on the *SGG*'s free subscription list. More requests arrive, weekly — eccentrics, all. Like to join 'em?

How did you like this *Gazette*? Was it helpful to have all the extra information about Compcon'86? Are you a "qualified" entrepreneur, interested in underwriting/sharing a future issue?

Please let us know: *SGG*, 345 Swett Rd., Woodside, CA 94062.

PANEL: SHOULD COMPUTER SCIENCE CURRICULA BE ACCREDITED?

Issues and concerns caused by establishing the Computing Sciences Accreditation Board (CSAB) and development of an accreditation program in computer science were addressed at two workshops held in 1985. A summary of these workshops and a look at CSAB's first year of operation will be discussed in a panel environment at Compcon '86.

The trend towards accreditation of computer science curricula has caused concern among individuals involved in liberal arts programs. Many feel that the CSAB criteria are too heavily weighted toward engineering-type programs, not providing opportunity for accreditation of high-quality programs within the liberal arts. Recommendations for changes in CSAB criteria were developed at the workshops, as well as suggestions for interpretation of the criteria in a liberal arts context.

Presentations include "Computer Science Program Accreditation and the Liberal Arts College: A Summary of Two Workshops," by G.L. Engel, and "Computer Science Accreditation at the Age of One," by T.L. Booth, both of the University of Connecticut. Panelists include Yale Patt and Gene Lawler of U.C. Berkeley, Ed Lee of Pro-Log, and Dennis Bjorson of Boeing. The panel session chair is Thomas Cain of the University of Pittsburg.

Compcon'86 session

Designing with Gallium Arsenide

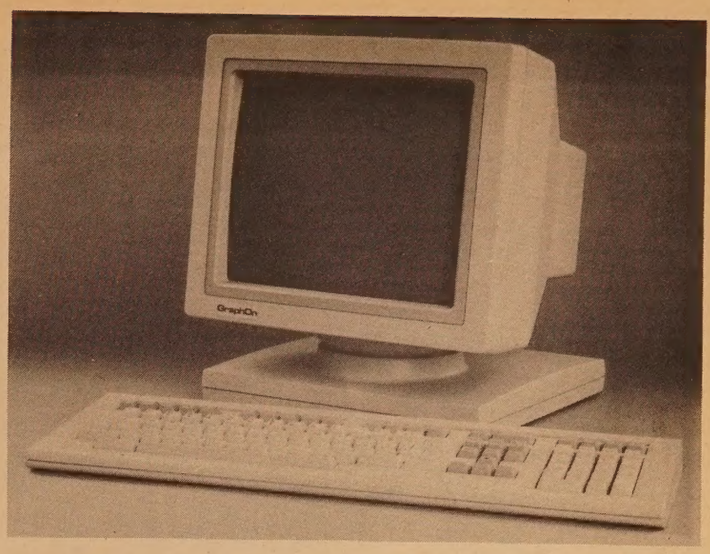
This session addresses specific problems associated with the introduction of GaAs components into practical digital hardware. The session, chaired by Steven Long of U.C. Santa Barbara, will be presented at Compcon '86, March 3-6 in San Francisco.

Dr. Louis Tomasetta of Vitesse Electronics will offer views from a GaAs IC foundary on current progress in LSI/VLSI IC fabrication and design. Exceptional results from MSI and LSI GaAs chips are regularly reported in engineering literature. Tomasetta will examine whether these are strictly research results, requiring infinite care (and large budgets), or whether commercial products and custom chip capabilities will soon be accessable to the broader electronics community.

The other two presentations are from users of the present GaAs IC technology, one with access to both in-house fabrication and commercial foundary facilities. They will discuss the current capabilities and limitations of the GaAs foundaries.

Steve Nelson of Cray Research will present "Managing the Multiple Component Problem for Large GaAs Systems." The problems associated with the design of supercomputers requiring multiple components and precision timing will be discussed in the context of limited chip complexity, power constraints, and developing, and changing, process capabilities.

An alternative approach to application of GaAs in computers is to minimize the system complexity by adopting a RISC architecture. Wayne Moyer of RCA Advanced Technology Laboratory, an advocate of this approach, will discuss methods by which computers can be made with GaAs components fabricated by an external foundary. Questions regarding specification and control of device and circuit parameters and the evaluation of GaAs IC's will be addressed in his presentation, "Viable Realization Issues and Lessons Learned for GaAs Ultra Speed Micro Systems Design."



Advanced Alphanumeric/Graphics Terminals

GraphOn Corporation has recently introduced the GO-200, GO-230, GO-240 and GO-250 family of composite terminals, GraphOn's latest DEC and Tektronix terminal emulators for both the end user and OEM markets. Units are available for shipment in October.

Utilizing a 68000 microprocessor and over 50,000 bytes of firmware code, GraphOn's GO-200 series offer emulation of thhe DEC VT220 and Tektronix 4010-4015 terminals, state of the art ergonomic tilt and swivel capabilities, a low profile keyboard, a 14" display with etched screen for glare reduction and a reduced footprint. Non-interlaced 60 Hertz video refresh, eliminating both flicker and smearing.

To fight terminal obsolescence, the new GO-200 series terminals can be upgraded as higher capabilities are needed by the user. The terminals are designed to be fully compatible with GraphOn's popular GO-140 and GO-160 terminals. The GO-200 series ranges in price from $995 to $2,495 and is available with quantity discounts.

For additional information, contact: GraphOn Corporation, Tower One, Fifth Floor, 1901 S Bascom Ave, Campbell CA 95008 (408)371-8500.

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Amiga users can now print all of the Amiga's 4096 screen colors using the $169 Okimate 20 from Okidata, with the $99 Plug 'N Print kit.

Cars to Drive Signal Processing

Imagine driving across the country and pinpointing your location with a satellite-ranging device mounted directly on the dashboard. Or having the car sense the moisture accumulating on the windshield and automatically turning on the wipers. Well, advances in signal processing techniques will soon make these futuristic-sounding scenarios a reality. According to a new 139 page report from International Resource Development Inc., a Norwalk CT market research firm, products such as these will be relatively commonplace by the mid-1990s and will themselves represent a multi-billion-dollar market. The current market for signal processing system and subsystems, by contrast, still is dominated by technologies and dollars, related to such military signal processing applications as radar and anti-submarine warfare.

The report, entitled "Signal Processing Market Opportunities (#678)", points out that rudimentary versions of sophisticated automobile-mounted devices are already making their way to market in the form of "talking" warning systems (which tell the driver "please fasten your seat belt" or "a door is ajar") and state-of-the-art electronic audio systems. However, as time goes on, the general purpose microprocessors currently controlling these functions are expected to be joined by special digital signal processors that will control such vital automotive functions as engine performance and collision detection. Satellite navigation and the like are then but a small step away.

Already On The Road

The automotive and signal processing industries are already well on the road to implementing such systems. "Go outside and look under your hood right now, and you'll find more electronic gadgets than you ever thought possible," said Leslie Townsend of the IRD research staff. "These little microchips already control everything from electronic ignition to fuel injection and are beginning to appear in braking systems as well. The rest is just a natural follow-on awaiting nothing but more favorable economics and some semblance of customer demand."

The IRD report points out that today's automotive signal processors tend to be fairly generic because the vehicular events they control generally do not occur fast enough to warrant the use of super-fast special digital signal processors (DSPs). However, the application of DSP techniques to the car's most vital systems — and to such desirable and profitable (to the dealer) options packages as navigation — will soon require that the special DSPs make their appearance in a big way. "No doubt this is one reason General Motors and the other big auto makers are investing so heavily in high-tech companies," Townsend said.

IRD states that the shipment of special DSPs to the automotive industry will account for $20 million of the total 1985 DSP market of $293 million. In 1996, however, the automotive segment will account for $150 million of the overall market of $1.14 Billion. Thus the automotive segment will increase its share of the total market from 6.8% to 13.2% in 1996.

Within the automotive field, braking systems will emerge as the biggest consumer of special DSPs, moving from using a bare $1 million worth of special DSPs in 1985 to absorbing $57 million worth of the chips in 1996. Engine systems, on the other hand, will fall from first to second place in the next decade, moving from utilizing $10 million worth of special DSPs in 1985 to $25 million in 1996. At the same time, the market for braking systems end products containing DSPs will grow from $200 million in 1985 to $5.7 billion in 1996, while the market for engine system end products will grow from $1.7 billion to $2.7 billion respectively.

A free table of contents and description of the $1,650 report (#678) "Signal Processing Market Opportunities" is available from IRD, 6 Prowitt Street, Norwalk CA 06855, (203) 866-7800.

Concurrency Control

Concurrency control will be discussed at Compcon'86 in a session chaired by Hamid Pirahesh of IBM.

Concurrency control algorithms have traditionally been based on locking and timestamp ordering mechanisms. Recently, optimistic schemes have been proposed. In "Distributed Multi-Version Optimistic Concurrency Control for Relational Databases," Arthur Bernstein of SUNY will describe a distributed, multi-version, optimistic concurrency control scheme particularly advantageous in a query-dominant environment. The algorithm overcomes the deficiencies of the original optimistic concurrency control scheme — that transactions may see inconsistent views, and read-only transactions must be validated and may be aborted. Unlike multi-version timestamp algorithms, read-only transactions cannot cause other transactions to abort. Users do not suffer from deadlock and cascading rollback problems of other distributed optimistic concurrency control schemes.

Goker Gursel from San Diego State will present "Optimal Processing of Simple Queries in Ring Networks." The dynamic programming algorithm developed for solving simple queries in chain networks is extended to solve similar queries in ring networks. The goal is to minimize volume of data transmissions.

The problems of concurrency control, transaction serialization and deadlock control are among the most difficult to solve in file system design. Anna Hac of Johns Hopkins will present a detailed file system model with distributed concurrency control, in "Concurrency Control in a Distributed System and Its Performance for File Migration and Process Migration."

GIANTS, COMEDIANS ... *continued from page 14*

brash statements. Nor is SteveJ the picture of perfection — he can be petulant, head-strong, impatient, blunt, insensitive and demanding. I have also seen him be gentle, caring, intelligent, innovative and energetic.

This is a call for more responsible reporting — a call for greater journalistic integrity. Mature reporters should know better than to accept the self-serving pablum we ego-maniacs put out about ourselves and our ventures. Equally, reporters have a responsibility — greater than most — to maintain even-handed reporting, rather than exhibiting the same level of petulant, irresponsible arrogance about which they complain. (Please note that I've not named the columnist or newspaper about which I've sarcasmed.)

Even now — after Woodard and Bernstein Watergated, and *People* magazine has provided a profitable editorial model — *It ain't fair to tear 'em down, if you're the ones responsible for buildin' 'em up.*

In the meantime, a caveat for the careful (particularly applicable to what you read in this rag):

Never accept what you read in a newspaper as being true — especially if its about you and says you're great!

The Case of the Hidden Ribbons

We have a 600-lpm CDC line printer. We needed ribbons. American Peripheral Exchange, the CDC peripherals dealer from whom we purchased the printer, told us to call CDC Customer Service at 408-744-5458, or call the main number, 744-5444.

We called the first number. That turned out to be Maintenance. They said we should talk to Dispatch at 744-5413.

We did. They told us we'd have to talk to Parts. At this point, we called the "main number" ... that didn't answer.

We then talked to Parts, answered by an abrupt "Hello". We asked if this was Parts. They said, "yes," hesitantly. We asked if they were open. "Yes." Gaining confidence, we asked for ribbons. Dashed hopes — they said they didn't handle commercial customers; that we should to talk to sales.

Having become less than enchanted with the staff knowledge of who does what at CDC, we asked what their main switchboard number was. They didn't know.

They switched us to Sales. Sales didn't handle ribbons; only OEM sales. We should talk to the Business Products Group.

We did. BPG couldn't sell to us, but we could get the ribbons from one of their distributers . . . who wasn't in at the time (a large distributer, no doubt).

We asked for the name of another distributer. BPG didn't know of any others on the San Francisco Peninsula. Apparently, CDC didn't have very many installations on the San Francisco Peninsula. That's understandable.

Afinal Asilomar:

Q: "What is the average instruction length for [a major microprocessor]?"

A: "If you take the total length of all the different forms of all the different instructions and divide it by n, *you'll have a number that doesn't mean much."*

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Database Management for CAD/CAM

Automation of an entire product life cycle is the ultimate goal of CAD/CAM — and database management technology is the key to integrating the existing islands of automation into a whole to achieve that goal.

Some important issues in CAD/CAM database management include configuration of data during the design process, distribution of data in a heterogeneous environment encompassing various DBMS's and computers, and management of data and the processes operating thereon. These and other issues will be discussed in the session "CAD/CAM Database Management," at Compcon '86, March 3-6 in San Francisco.

Session chair Dr. H. Randall Johnson of Boeing Computer Services will discuss "knowledge based management systems," incorporating significant capabilities of expert and database management systems, and approaches to developing such systems. Such systems also provide intelligent control of processes operating on CAD/CAM databases.

Gordon Landis of Mosaic Technologies will present "Design Evolution and History in an Object-Oriented CAD/CAM DBMS," a discussion of configuration (version) control of database data, partial constraint satisfaction, and other topics relative to the design environment.

Dr. Stanley Y. W. Su of the University of Florida will discuss distributed database management capabilities being developed for the Automated Manufacturing Res. Facility.